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Shadows and Straws

THE ANCIENT ARCHITECTURE of England is fast nearing what almost might be called a crisis. Very many old buildings are in urgent need of difficult and costly repairs. Westminster Abbey has needed a large sum of money which, though raised and spent, promises still be to inadequate. St. Paul's is asking for thousands of pounds. St. George's at Windsor is reported to be in imminent danger, while Lincoln, Ely, and Peterborough are all confronted with grave problems of preservation. Ultimately it seems likely that the question will have to be considered as a problem of national finance and even of taxation. While it is true that on a recent appeal there seems to have been raised £50,000 for preserving the old home of the Society of Arts in the Adelphi, London (designed by Robert Adam in 1775), the fact also remains that it is becoming more and more impossible to rely upon such contributions from private sources. Indeed, the question is already being asked in the English press as to whether the State, confronted with the apathy of the average taxpayer in these matters, has the right to compel him to contribute toward the maintenance of ancient and historic buildings in structural safety, at least.

INDEED, it is not at all unusual to read, nowadays, the words of pre-parting addresses delivered by the land-owning nobility of England to the assembled tenants. Even the Duke of Portland, reputed of great wealth, spoke solemnly to the tenants of Welbeck. "It may or it may not be possible for me and my family to continue to reside at Welbeck," said he, "but I fear there can be but little doubt that those who come after me will not be able to do so." Now as it was largely this class who supported so many of the innumerable private funds such as those for the preservation of old buildings, one may well understand why the question is likely, at no far distant date, to become a State matter. Actually, of course, it is the people who really support all of these things. The way of the present order has been to allow the collection and disbursement of the money through private hands. Why should not the State collect and distribute it with less waste and greater benefit?

It is quite true, as the *Guardian* remarks editorially, that commissions for great English country houses will be rare in the land hereafter. The days of Haddon, Montacute, Longleat, and Knole are gone. It seems impossible to believe that they will return. Yet, if we deplore the happening, in remembering certain unmistakable charms, shall we not on the other hand look forward to the vastly greater architectural problems that are everywhere confronting us. Never was there a time with such possibilities. Never was the world more ready to achieve a magnificent architectural flowering. What we fail to see is the kind of flower that is waiting to bloom. It will not be the old kind, born in princely vanity or aristocratic ostentation. It will be a newer kind, more closely related to our modern life with its vaster scale. Planning must advance from the narrow limits of the individual and generally selfish use of land, to the point where it will see communities as living organisms, possessing equally the germs of life and the real basis of architecture.

"ART for art's sake" is a truism that we have covered with ridicule. It does not pay, we have cried, and our art reformers, in return, have cried to heaven that art will pay if only we will use it in our business. All of which is something very like what it is thought impolite to call a lie. Art never was meant to pay, in the sense of conferring a money benefit under a profit-making system of life, commonly called and commonly mistaken for civilization. "Wherever art has flourished securely," says Mr. Clutton-Brock, whose writings are now coming to be known in our own *Atlantic*, "there has been no question of making it pay. The Greek Drama was not expected to pay, nor was the Parthenon, nor were the Gothic cathedrals, nor the paintings of Raphael and Michelangelo. Certainly, if we are to have any great and secure art, we must expect it not to pay. The fact is, not that we can not

afford art, but that we prefer to spend our spare money and energy, and more than we can spare, on nonsense for nonsense' sake; and that, not our poverty nor our stern common sense, is the reason why art does not flourish among us.

"Stern common sense, if we had it, would lead us at least to the beginnings of art, to those conditions without which it cannot flourish at all. Take, for instance, Manchester. Was it common sense to allow it to be built anyhow and to suffer anyone who chose to darken the sky with smoke at noonday? A people that cared for art, and was ready to make a common and individual sacrifice for it, would have built cities better to live in and better to work in, and would have saved incalculable millions by doing so. But here I will confess that I do not believe any people can be led to this far-seeing wisdom by common sense alone. Human nature is such that it can attain to common sense only as a by-product of the high disinterested passions, such as the passion for beauty. If we aimed at beauty, we should also achieve cities that were good to live and work in; by trusting in our common sense we have achieved the slovenly muddle and dirt and discomfort of our big towns.

"That is why I would preach the doctrine of art for art's sake. Love beauty, and many other things shall be added unto you; be indifferent to it, because it does not seem to pay, and you will find that the common sense you trust in is common nonsense. And, after all, are we famous in history because of our merchanting and engineering and the like? Victor Hugo said that it was Shakespeare made the difference between England and Carthage. Carthage was destroyed because she would not fight for herself but left Hannibal to fight for her; but we were not destroyed in the war, because we had something in our past to fight for besides merchanting. This something meant to the common man of today whatever in the past Englishmen had done disinterestedly and for the love of it; it meant, though he would never use those words, art for art's sake. And if, now that we have won, we are content to live lives only of business and what we are pleased to call pleasure, our minds may be slow, but they will not be logical. We shall make an England not worth living in or fighting for; and sooner or later it will go down, like Carthage, through the weary indifference of Englishmen.

"The great problem of our society, different from the problems of any former societies and even more urgent, is this. We have, through our mechanical contrivances, far more superfluous energy than any former society; but we have not learned yet how to turn that energy to the activities that are called spiritual. It is, however, becoming more and more clear that if men use all their superfluous energies for material purposes they poison themselves with those energies, as we poison ourselves with food if we eat too much of it. The war itself came of energies turned to material purposes which should have been turned to spiritual. Instead of spending our money on art and science, we armed ourselves like lobsters or rhinoceri; and then the most armour-plated rhinoceros of them all attacked the others, trusting in its triple hide. And, because we were so heavily armoured, we almost destroyed our whole society before we had finished. That is one example of the poison of superfluous energies applied to material purposes; and as for the others, they are everywhere. We might now refuse to spend money on art with some reason if we were living stern ascetic lives like Puritans. But we are not; and nothing will make us live them except a passion for spiritual activities, and among them art for art's sake, whether it be music or buildings or the drama. So long as we trust in our common sense we shall waste our superfluous energies on material pleasures and defences and poison our minds and bodies with that waste."

QUITE in a similar vein were the remarks of Lord Crawford, speaking recently at the Manchester Art Gallery. "In art," said he, "ocular criticism ought to be restored to the status it used to enjoy in the earlier days. We should let the eye tell its story to the brain, and let it take the initiative in visual criticism as against purely intellectual criticism. We ought to trust more to the eye and less to the intellect in the criticism of art. A work of art once preached its own gospel, and public opinion used its eyes and pronounced its verdict without external help. The old masters knew no criticism beyond comparison with the truth. The public ought not to lean too much upon the professional critic. It ought to begin to criticise for itself and realise that criticism was not the sole province of the professional."

Wise words. Yet how difficult to apply the counsel they contain. Education does not, as at present conducted, invite initiative. It is based upon the process of molding young minds into certain ruts and grooves, and, as a consequence, the average person is utterly afraid of speaking his mind on any question of art. Rather does he seek to fortify himself behind what he thinks is the accepted verdict or the going opinion. And the exceptions,—well, of course, they have a hard time, until the old rut happens to be abandoned. Then, they seem quite natural and respectable people. In the meantime, the professional and amateur critic does a thriving business in supplying mental fortifications and in feeding the opinionated vanity of the group, which, after all, has to consider the eternal problem of bread and butter. Even so, by the way, it seems a dreadful fall from the days when architecture was publicly discussed only by those who had seen the building about which they talked, to the present time when anyone having some facility with words,—to which is frequently added a vitriolic or sarcastic pen,—criticises half-tone plates of photographs of buildings, sometimes even before the buildings are built,—when the criticism is often based upon half-tone plates of photographs of wash drawings of buildings! And always with the grand manner and that flourish of trumpets which, like the fanning of the vampire's wings, prepares the victim for the painless insertion of the proboscis through which the sapping is to be done. The vampire sucks blood,—the critic saps something more precious,—the will to think and to know those values in beauty which alone have an abiding meaning, because they have been found—alone.

THE BILL for registering architects in the District of Columbia, to which much impetus has been given by the dreadful fatality attending upon the Knickerbocker Theater disaster, has received the tentative sanction of the Executive Committee of the Board of Directors, and will undoubtedly be approved by the full Board, even though it puts

the Institute squarely on record as favoring registration,—a thing which the Institute has so far declined to approve except in principle and as deemed expedient by local authorities.

It is time, much as we may doubt the value of registration as an instrument for directly improving the esthetics of architecture, that the marvelous myth about architects in this country was put to death. There are many interests which seek to keep alive the belief that there are thousands of architects in the United States, and to flatter the veriest tyros and amateurs into the proud thought that they belong in the class and are entitled to professional consideration. There are, as a fact, perhaps 4,000 men in the United States who can possibly deserve the title of architect and who can safely be entrusted with the design and supervision of a building. There are some thousands of others who masquerade. There are some hundreds of others who are really deserving men, struggling to meet the honest needs of their clients in many small and trifling commissions. But a study of the effect of the registration laws in the United States will convince any disinterested person that public policy demands the speedy enactment of such laws in every State in the Union, to the end that standards of practice may be raised to a level insuring the minimum of fatalities and dangers to the public at large. In the course of not many years we shall then be quite astonished to discover what a fiction has prevailed, as to the number of architects in the United States, and very likely we shall also witness a considerable architectural development, the moment we begin to cease the making of architects by means of pictorial methods. The so-called architects,—and their name is legion,—remain in practice only because of their ability to live off the brains of their fellows. And, through vanity and nothing else, the competent lend their brains to the incompetents, who fill the land with their bastard spawn, often as dangerous to life as it is insulting to the senses. Registration, in time, will put an end to a great deal of incompetence, and the recent theater disasters demand action by the real architects in the profession.

The Boomerang

One day he came into my office; said he knew well enough that I would not go into a wildcat competition. But they were agitating a new school in his home town; he wanted to get in on it; and would I mind if he associated with a young firm who was doing that sort of thing.

Of course I did not mind his associating with someone else; but I had no sympathy with such a procedure; and I repeated the time-worn arguments against wildcat competitions; pointed out how it ordinarily worked out and all that sort of thing. But it was no use for me to argue; I was old (which I reject most emphatically) and well established (which is not at all the case in these days of architectural mirages); I could afford to let opportunities slip by like the hours if they made no appeal to my fancy. But he was young and had just returned from the Conflict; the cost of living was bearing down upon him and time was fleeting. How could he gain a footing if opportunities were not seized?

My argument made no appeal; it was useless to argue. So the association was formed for the project and competition drawings were submitted to the School Board.

Some time elapsed. He had been home; had talked with the School Committee; the prospects were not at all promising; most of the members of the Committee had fallen for a most inferior design—one much more expensive and not well adapted to the conditions of the site.

Some more time elapsed. A letter came one day from the chairman of another committee of another project in his home town,—a project upon which we had been working in association for several months. In this case a contract had been executed covering our work and defining the terms of payment, fixing a limited fee for preliminary sketches. For at the outset the cost of the project could not even be guessed at; the requirements were at first most indefinite. But they became definite soon after work had started. We thoroughly threshed out the approximate cost of the building, using the then current prices which had grievously shocked the committee. Altogether, three sets of sketches had been prepared for schemes gradually shrinking in volume until at last it appeared that it was possible to provide what was needed within the cost limit. And it appeared that all were satisfied. Certainly we had gone into the matter thoroughly; statements of cost had been made with each of the three sets of sketches; and we had spent somewhere more than the limit of our remuneration set by the terms of our agreement.

A letter came one day from the chairman of this committee. He had gone into the matter thoroughly and had come to the conclusion that the building as finally designed was most unsatisfactory; it would cost altogether too much; we had proved to be expensive architects. In view of all this, would we settle for a sum approximating one-third the amount then due us?

This was somewhat puzzling. My associate had just been home. He had gone not as my associate but as that of the young firm who go into wildcat competitions. He had gone as the anxious competitors go to look after the judgment of designs in wildcat competitions. At this time everyone had appeared satisfied so far as our project was concerned. It was a matter of raising more money and smoothing out some differences between those who would call it a memorial and those who would call it something else.

So an inquiry was made as to what had occasioned this change of attitude. And this is what we found: it had been noised about that the committee in charge of our work had entered into a contract with us and had agreed to spend real money—a considerable sum, it had been stated—to engage a firm of city architects. This was an unheard of procedure—a case of having "put over" something. Was it not plain that such an expenditure was entirely without provocation? Had not the School Board been able to get any number of sketches by simply

letting it be known that the community at some time in the future might possibly build a school? Certainly the committee in the case of the other building had not been very astute. It had plainly been bamboozled by the oily words of a good talker. And to have it said of a committee and its chairman that they have been bamboozled does not add to one's dignity if one is on a committee.

So, there is the chance that he will lose out upon the project on which we are associated, and the chances of his winning out in connection with the school are not as good as they might be. The agreement, which in the case of our project had appeared as a perfectly fair proposition, became over night a perfectly obvious case of "putting one over." And while "putting one over" is not ordinarily treated as an act to be censured, it carries its penalty all the same. One must watch out for those who so view the matter.

So, said he, what had best be done?

But I did not know. Had he been hit a crack in the jaw, I might know what to suggest. He might hit back or he might run off and get a policeman. There were many things he might do under such circumstances. But to be hit by a boomerang flung by his own hand—that wa different. I really did not know what he had best do·

R. W. T.

Registration

The West Virginia bill for the registration of Architects is so closely framed on the principles laid down in the "Model Law" adopted by the American Institute of Architects and is so just in its general provisions that it is not likely to involve the profession in any annoying technicalities. The only provision which may disturb is that relating to the fee for registration or renewal. If you are unfortunate enough not to be a legal resident of that state you have to pay a fee of $50 to obtain the right to practice. If you carelessly fail to renew your certificate at the end of the year you must pay a fee of $10 for renewal. You have to pay $10 for a renewal even though you have in mind the necessity. This requirement of the law may be criticised but the bill shows such careful thought in its preparation that it is to be presumed that the financial conditions were well considered.

W. P. B.

The Architect and the Engineer

By WILLIAM L. STEELE

Differentiations

The architect has always had to do with buildings and their surroundings and equipment. His field may and frequently does extend to groups of buildings and, so to city planning. He may be capable also of designing and directing the decoration and furnishing of a building down to the last detail.

The engineer may also have to do with buildings and their surroundings and equipment, more particularly those of commercial or factory type. His field may and frequently does extend, to groups of buildings, and so to city planning. He may be capable also of designing and directing the mechanical equipment of buildings down to the last detail.

This very general outline seems to indicate many points of contact between the two professions and only one difference. Hardly ever does an engineer assume to design and direct the decoration of buildings. There is, however, a deeper difference,—a finer distinction. There are architects who specialize in particular types of buildings, who do nothing but design and supervise the building of banks, churches, schools or theatres. There are men who have been trained to be architects who narrow their field to mere details of design, arrangement, or decoration. There are architects who devote all their time to quantity surveying, who do a great deal of landscape work,—who are students and practitioners of city planning. Some have even gone into contracting and building.

In the field of engineering, for the purpose of this article, we ignore the many branches of service not concerned with building, yet we still have left a number of interesting specialties. The structural engineer deals with problems of construction but does not ordinarily plan the building. The architect usually does that and when the design is fairly well articulated, the structural engineer may criticize it in its relation to economy in the use of material; he may suggest the best methods of fire-proofing, the type of foundation, wall, column, or floor construction, and then he figures and designs the footings, columns and all other structural members. For heating, plumbing and wiring a building there is an engineer expert qualified to determine the most economical and efficient equipment. Nor should the civil engineer be forgotten for he must survey the property, establish the "metes and bounds," lay out the contours, and often, as in the case of intricate trackage problems, his advice has a great deal to do with the final form of the building.

The Mold

The architect is working with all this engineering talent, coordinating it, molding it into the fabric of his design. Often compromises have to be made, sometimes in the interest of utility, convenience, or appearance on the one hand or for economy and efficiency on the other. It will not suffice to design a building solely from the structural point of view, any more than to design it solely from the esthetic or from any single point of view. The finished building must satisfactorily fulfill the main essential requirements and exactions of all points of view as well as those of him for whom the building is built. We may go farther, for the real needs of the man who wants a building may be quite different from those he admits and proclaims,—the difference between what he thinks he wants and what he ought to have. Too often these needs are not supplied, and after the building is finished and its weak points in design, its superficial and short-sighted planning begin to be manifest, the owner may then in some

measure realize how far his building is short of what it should have been.

The Form

Who is to supply this sagacity, this far-sightedness? Either the architect or the engineer may, but I think I may safely say that this peculiar talent belongs more naturally in the architectural than in the engineering field.

Go still farther. A man who builds a building of his own likes to believe that he has a good looking building. So it may seem, in a sense, for a time, yet later on it may become successively a thing to be tolerated, endured, and then abominated. Or it may be a building which grows with the passing years. It may be anything between these two extremes, but the ideal is surely the latter. Along with the increasing joy in its fairness to the eye should go a kindred pride and pleasure in its use and occupancy. Things that were passing fads of the moment have had no part in it. It fits, and is easily adaptable to those changes in conditions of occupancy which the years so surely bring. Its honesty and fine quality of construction make the upkeep light. Its scientific plan has made possible efficient and economical administration. Its first cost, however high it might have seemed, is forgotten in the satisfaction which the serviceableness and winsomeness of the building have produced in the owner's mind.

What wisdom will secure these desiderata, and who is to supply it? So far as I know engineers do not claim very much in this particular field. It requires a faculty of a creative nature. It is not a dream faculty. It exists. We find it unmistakably in all the great architecture of the past. It belongs historically to the architect. "Why then," you say, "does he not claim it and exercise it? It is the one thing since the beginning of building that he alone may do—that is his own especial divinely appointed faculty." To answer that question adequately would require an entire essay. Let us pass it for the moment. The personal element looms large in all of this because we are talking about *men* who practice either the "*profession*" of architecture or engineering, or both.

The Men

What is a profession? I do not know, in the last analysis, unless it be one of such walks in life in which the service rendered is not measured in terms of money, but in terms of the very best endeavor of the trained practitioner. How, then, shall we recognize as professional the many who, in both architecture and engineering, do their work on a strictly commercial basis? We will not discuss the lower forms of graft and dishonesty which here and there are indulged in by members of our professions. The relations of architect and engineer, however, when studied into, reveal many dishonest conditions which ought to be rectified. It is hard to see how a man can be honest with his neighbor if he is dishonest with himself. No engineer and no architect who is honest with himself, can seriously entertain a belief that he is sufficient unto himself, that he knows all there is to know, or even all that he ought to know about his profession. And yet there are architects and engineers who talk and act as if they so believed. There are architects who claim that they can handle their building problems without the aid of the engineer. There are engineers, likewise, who claim that they can take ample care of their building problems without the aid of the architect. Their works prove them both wrong. There are architects who are consistent in this and who actually do such work as they have without assistance, but by far the majority of those who claim self-sufficiency, secretly conspire against their clients, as well as the honest men of both professions, by making use of so-called "free engineering service." This is offered by a great many manufacturers and jobbers of building materials, because it gives them the best possible "approach" for a sale unhindered by real competition.

There are other architects who frankly admit that they need engineering help, and who still can not see the wrong they do to themselves, their clients and their profession by using this mis-named "free" service. There are still other architects who admit the need, and who ally themselves on an equitable financial basis with such structural and mechanical engineers as the work in hand requires. All these cases can be reversed and put with equal force for the engineers, although those who are practicing "architecture" are comparatively few.

Assuming a relationship that is open and above-board, that is fair and equitable between architect and engineer on a building problem, it is easy to see how a strong architect may dominate a weaker engineer, or a strong engineer may dominate a weaker architect, or, again, men of equal character, ability and brain-power may lock horns and mess things up by the unyielding impact of equal and opposing forces. The ideal relationship is reached when each unselfishly devotes his best effort to a harmonious and happy solution, having in mind first: The interest of the man who is spending the money, and second: The ideals of the profession which each represents. (I am here speaking of things as they are and not of things as they should be, when the needs and the welfare of the community shall take precedence of all.)

The Leader

We tread upon dangerous ground when we begin to discuss the question of priority as between engineering and architecture. The point is sometimes raised, and let us consider it, fairly and generously. There is surely no question about it when we discuss statics, hydraulics, physics, chemistry. The engineer is supreme in the practical application of these sciences. In the vast fields of machine design, thermo-dynamics, electricity, standardization and testing of materials, bridge building, reservoirs and water supply, power development, sewage disposal, public utilities, railroad engineering, mining engineering, practically all the problems which have to do with applied science, the engineer has all the best of it. He sits in the "Seats of the Mighty" and has it all his own way.

The question of precedence between architect and engineer would never come up were it not that both are interested and engaged in the design and the supervision of the construction of buildings. Here they may and sometimes do clash; the engineer may and sometimes does regard the architect as one who has concern only for frills and furbelows; and here the architect may and sometimes does regard the engineer as a coarse person who would just as soon run a steam pipe across a bay-window as not,

if by so doing he could save ten feet of pipe. As a matter of fact, each is necessary to the other. Neither one could well be spared.

But the question still persists: Which comes first? The engineer has a vast patrimony upon which the architect scarcely ever ventures to set foot. Need he then be jealous of the architect in the comparatively restricted field of building? Should he not recognize as good business and common sense that agreement must be made as to which is to have the final word, which is to be at the head of that complicated, sensitive, changeful organization, which must be assembled in order to design and build a successful piece of architecture?

When Craftsmen Knew

In the Middle Ages and at the time of the so-called Renaissance the comparisons we are making and the questions we are raising could hardly have been proposed for discussion. In those times, men highly skilled in statics worked out the problems of vaulted roofs, flying buttresses, and concentrated load, to a wonderful exactness. They had no stiff ribs of steel on which to depend, but were forced to transmit their stresses joint by joint from one carefully designed block of stone to another. But these men were either the architects themselves or their assistants and employees. Sometimes the architect was a priest or a bishop, sometimes he was a nobleman or knight, but we are forced to conclude that he was always a poet or an artist. Nor is there any evidence that would lead us to assume that men saw anything strange or unusual in that. The spirit of art was very much at large in those days. Men possessed it with the same common freedom and the same absence of self-consciousness as the air they breathed. It came from a happy religious and economic condition which we English-speaking people have not been taught to understand and appreciate. Appreciation of art was practically universal. Talent was common. High proficiency in craftsmanship was the rule, and was the key which opened the doors for admission to the "Guilds" which were the labor unions of those times. Out of such a background genius frequently emerged. Michael Angelo was a famous architect and a greater painter and sculptor. Raphael was an architect and a sculptor, too, although his fame as a painter of Madonnas has overshadowed his work in other fields.

In those days men recognized the real value of beauty in life. Their buildings were beautiful. There was no argument about the money value of a beautiful piece of work as compared with what was ugly. They were full of faith in a religion which taught them beautiful truths. They lived—in the main—in harmony with those teachings. They saw the beauty which exists in Nature, and tried to translate it into terms of brick and stone and marble. They told the same story in most delicate and elaborate metal work. They illustrated it in glowing colors upon their walls. There was poverty—yes; and injustice—yes; and violent passion—yes; but the big resultant of all the play and counterplay of the forces of that age which is written large in the records that are left to us is that it was a deeply religious age and it was an age of art.

Unity and Variety

The architect was the Master Builder and he was the Master Artist. He knew how to encourage initiative in the artist-craftsmen who worked under him, and how to restrain and guide his subordinates so that the final result was harmonious. In all the great buildings of those days we find the same basic unity underlying dazzling variety as they exist in Nature. To make myself clear consider the basic unity in design illustrated by a group of trees of the same kind. In a general way they all look alike. Each one has the same component parts. All have like roots, trunks, limbs, branches, leaves, blossoms; but no two of the trees will have exactly the same form and so at once is introduced variety. The markings of the bark of these trees vary as much as do the thumb-prints of human beings. Furthermore, no two of all the countless leaves are exactly alike. In much the same way the buildings of that age have none of the machine-made regularity that makes our modern structures so monotonous. There are easily recognized types in plan, general construction and form, but the bewildering variations in the working out of the details have been the despair of students who have tried to classify and label.

When Expression Counted

So much for the past glories of architecture. It was great but it was not greater than the civilization that produced it. "The stream can not rise higher than its source." The reason that we can not produce great architecture now is chiefly because of our habits of thought and desire. In these days men have lost their sense of real values. Just as they have lost faith in religion, while admitting its value as an influence on the side of law and order so they have lost faith in art, while admitting that it is a pretty and beguiling accomplishment. The ancient art-gallery was merely a part of a vast program. Art was everywhere, and only such masterpieces that could not with safety be displayed anywhere else were on view in the galleries. The picture galleries began as the result of the patronage of art by the prosperous and wealthy. Rival nobles bid against each other for the possession of a work of art. It became a matter of civic pride to own pictures or statues that were the envy of rival cities. It wasn't done to "uplift the masses" or to "educate" anybody. Everybody loved the work of the artists and those who could afford to possess it did so for the love of it. It was a great stimulus to artistic effort, and a new star in the firmament is not more gladly acclaimed by astronomers than was the appearance of a new possessor of the divine gift of artistic genius. Nowadays it is the hardest thing in the world for an artist to obtain recognition as such. He must either starve, or paint pictures of girls in transparent hosiery for the advertisements in the Saturday Evening Post. There are private picture galleries among the wealthy now as there always have been, but a great deal of the so-called "art" which they house is spurious. As for the public picture galleries, cities indulge in them mainly because thay are considered "the proper thing." The modern art-gallery usually seems as out of place in the midst of our ugly commercial cities as an Italian

"contadina" would seem sitting in native costume in an office pounding a typewriter.

Ours is an age of machinery and commerce. Modern industrialism has eliminated art as a necessity and made it a luxury. The modern ideal of education is to make a child self-supporting. The ancient ideal seems to have been to make the child self-expressing. The modern thought is: Do nothing yourself that you can pay someone else to do for you. The ancient thought was: Be zealous in doing everything yourself for which the Lord gave you talent for only so may you be able to develop a broader, richer, deeper life.

Pillage

I can imagine my readers growing restive in being asked to consider a by-gone time which most of us were taught was an age of ignorance and superstition. Nothing could be more untrue and unjust than that idea and it is my belief that a true understanding of the art of building can never be gained without some earnest study of the historic background out of which it has come. We are all products of our own age, but we are also children of the past. We have been taught architecture from a commercial point of view, and the result is in evidence. We have used our inheritance from the past, not with any depth of understanding and reverence, but superficially and impudently as though the past were a vast storehouse of plunder. We do not actually dismember the historic monuments and use the wreckage in our buildings, but we copy them and imitate them and have practically ceased to design in the sense in which the ancient architects designed. Architecture in its modern aspect is presented to us as a course of study which is a mere side show in a College of Engineering. The impression among the engineering students is that the fellows who take the architectural course do so to avoid calculus. From the earliest days of our technical schools the professors of engineering have been better equipped to teach and inspire than the teachers of architecture. There have been, of course, shining exceptions but I am speaking generally. Young men began to go to France to study architecture. The French welcomed them with open arms and extended palm. The French mind is one of the most versatile in the world. It has wonderfully keen perception and uncanny intuition. It sensed the American desire for tabloid information, its impatience with philosophy, its eagerness to get quick results. So they filled up our young men with French tricks, tricks of draftsmanship, tricks of "style." They made fine draftsmen, and the most skilled adapters, "fakers" and copyists that the world had ever seen. These young Americans became our successful architects in our large eastern cities. Their influence has spread like ragweed in August. They saw to it that French teachers were imported into our American colleges. As they themselves grew rich and lazy they brought Frenchmen into their own offices to do their "designing." They have developed as fashionable and acceptable in polite circles a kind of architecture in which a certain mode of appearance is insisted upon regardless of anything less. And by the same token they have weakened their own cause, and they have inflicted immeasurable damage to Art. Why?

The Mask

They have weakened their own cause because the American mind is keen enough to see that architecture does not consist in wearing a smock and using French phrases and dwelling in an expensive suite of offices. As the product of these offices is made public property in the finished buildings the engineer and even the contractor looks it over and says: "I can do that kind of stuff myself." And he can, and he does. Of course there is a certain finish and sophistication lacking is his work, but he "gets by." He makes a hit with the public on equal terms with the architect, because in the work of neither is there any of that creative thrill which the public can feel. The works of both are dead—hundreds of years dead and they all look alike to the man in the street.

They have inflicted damage upon Art because they have catered to the lost faith in Art to which I have referred. They have said unto themselves: "The people do not know the difference. Why should I worry and slave trying to express my own interpretation of a client's desire for a building when I can get him to feel happy over an ingenious 'crib' from something over which architects with consciences sweat blood in the long ago?" And so they have established themselves in a perversion which has become so wide-spread as to be well nigh universal. Any man who dare lift his voice against it feels as lonesome as must have John the Baptist. They have encouraged the thought that Art belongs to the drawing room and the long-haired and the high-brow. That it is purely a matter of emotion and sentimentality, to titillate the susceptible at pink teas! Nothing could be falser. Art is clear eyed and wise. Art is based upon common sense. It supplies a fundamental need of human nature. It tells you that you must not sacrifice the basic for the accidental. You must study your own problem.

The great buildings of the past were all solutions each of a separate and definite problem. One can not use them as answers to our modern questions. If you start out with the idea that you must design a bank to look like a Roman temple you have handicapped yourself at the start. You have imposed an arbitrary condition that really does not exist.

You are a portrait painter, let us say, and you have a commission to paint a portrait of a man who fancies that he resembles some celebrated character of history. If you are a real artist you will try to paint him as he really is. If he has a wart you will paint the wart, but you will also give his eyes the expression of the best thought that he owns. If you are a quack and a time-server you will flatter him. You will paint him with the fancied resemblance to Napoleon or Byron strongly emphasized. You will please his vanity, but you will have betrayed your Art. Behind his back his clear sighted friends will say that the picture is not a good likeness. Our modern architecture has become very largely just such an insincere study of ancient history. The trouble is that so wide-spread is the delusion that people have accepted it as orthodox. Men no longer recognize an honest and a vital building when they see it. It disturbs them unless it be dressed up in the old clothes of a bygone civilization. The sad fact that this masquerading possesses no appeal and no inspiration does not worry them at all.

The Face

The problems of the engineer have not been camouflaged for him. He lives in the present and is not concerned with the past. So modern are practically all of his materials, tools and appliances that he does not have to study what the Greeks and Romans did unless he happens to be fond of history. He cheerfully gets into architecture without any background at all. He makes neither the correct nor the incorrect use of the inheritance of the past. He lays out his plan and his construction together. He may overlook some refinements in arrangement, and he does not usually worry about how the thing will look. And now we come to what is perhaps the real reason why the engineer cherishes in his heart a disdain for the architect "and all his work and all his pomps." More than a few of the engineers' buildings do look better than most of our so-called modern architecture. The engineer may have made a monotonous looking building, but he has refused to introduce a lot of meaningless ornamentation. The bareness of a poorly articulated plan is only emphasized by piling on a lot of superfluous and silly arbitrary forms. Nothing more clearly shows the lack of continuity in the thought of the designer, than the attempt to conceal the structural members of a building by unmeaning "belt courses," "string courses," "dadoes," "friezes," applied colonnades and all that.

"Why then, O Socrates, would you say that the two professions are necessary one unto the other? It would seem from your discursive talk that Architecture is in a very bad way indeed, and that we engineers can get along very nicely without it or you . . ."

Again and Anew

Well, the point of it all is that we do need each other. The architect needs the untramelled directness of the engineer, his scientific habits of accuracy. On the other hand, the engineer needs the architect's background and splendid tradition. Because he is temporarily overcome by an attack of acute indigestion is no sign that he won't recover. The engineer can help him to recover. It doesn't matter what we call ourselves. If we love architecture and want to build in the same spirit in which the masters built we will ultimately be architects whether we carry a diploma to that effect or not. Times change, customs change, manners change, habits of thought change, but art does not change its meaning. The lessons for the future are to be found in the story of the past. Our present industrial system is in great distress. We do not know what the outcome will be, but sooner or later the fundamental needs of the human heart will find expression. The Great War came out of Commercialism. A hell's broth of avarice, jealousy, injustice, mixed with the "divine right of kings" and a fanatical idea of ruling the world. It was all founded in commercial war and commercial avarice, jealousy and injustice. It was commercial supremacy that was aimed at. What defeated Germany? I like to think that however nasty and sordid the job the motive was right. The higher ideals of Humanity triumphed. They have not been rightly translated into the terms of peace as yet. Our faith is still in the God of Battles rather than the Prince of Peace. But as mankind gets back to sanity and the nightmare of the war and all the evil and iniquity that preceded it recede farther and farther into the past, we will study anew the art of Life. If we know how to live well we will know how to express ourselves or at least know enough to give highest honor to the gifted few who know how to bring forth that which is inarticulate for most men into the clear light of poetry, music, sculpture, painting, architecture. We will no longer compel our poets, our singers and our builders to tickle our jaded fancies or to pander to our sensualism. We will demand of them that they share with us that larger vision of Truth which is their birthright. Now we applaud a man who invents anything from a new mechanical device to an Eskimo Pie, and we crown him with highest honor if he has thereby made a lot of money. Of the happier future I like to imagine that just as Raphael was acclaimed when he painted a new picture, our laurel wreaths will be bestowed on those who help to restore the world's lost beauty.

The engineer will have respect for the architect when architects are ready to prove by their works that they believe in the basic utilities of a building. Nobody denies the truth of Louis Sullivan's axiom that "Form follows function," but only too few practice it. The architect must not be satisfied with a building that is superficially "good looking." It must be a building which can stand the most searching analysis. The real conditions of the problem must have been met logically and sincerely. The issue must not have been confused by arbitrary exactions. The building must have been designed from the inside *out* and *not* from the outside *in*.

It seems to me that with such principles established there can be no real conflict between architects and engineer. Conflict there will be, and conflict there must be, between him who loves architecture and him who does not. They who love architecture will be the architects of the future whether they call themselves one thing or another. He who with the greatest love, and the deepest insight, and the clearest understanding will be able to interpret the needs and aspirations of the American people in terms of building will be the Master and we will all gladly yield to him the highest place.

Glastonbury

By S. F. and F. S. CAMPBELL

TO a pilgrim, wandering through England and coming at last to a certain quaint village in Somersetshire, there came of a sudden a feeling of reverent awe as he looked upon the scarred and broken remains of the once glorious Abbey of Glastonbury. Beyond lay the moorlands, mist veiled and still; above, that solitary hill, surmounted by the gaunt old Tor, and over all, the rose and gold of the setting sun. Violet shadows lay over the shattered walls of the noble clerestory, but the springing spandrels of the great arch were pink with a glow that seemed like a promise of new life, and through the roofless ruins sailed the slender sickle of the harvest moon.

Standing on that thrice holy ground, once the most splendid nave in Christendom, one can not but feel its mystic influence, and a flood of memories comes rushing over one, memories of half forgotten legends, of lightly heard traditions and of half read histories, all testifying to the glory and peculiar holiness of this, England's Mecca. Here was true building done. Here was work accomplished that fulfilled true ideals. Here was truth expressed in stone.

The story of Glastonbury is the reward of the inquirer and its study carries our thoughts and imaginations back through the centuries dim with age, to apostolic times, in which we find a well recognized tradition concerning the establishment of a church that was destined to become later one of the most honored sanctuaries of the Christian world.

For, from the days immediately following those in which Our Lord Himself was here on earth until about the middle of the sixteenth century, when the hand of man was laid upon it to wreck and destroy, Glastonbury was a centre of religious thought and teaching from which there came a light of lasting brilliancy whose rays have shone through centuries—a light that has influenced in no small measure the ecclesiastical history of later years. So, to those to whom the progress and development of the church of God on earth is a living interest, the Abbey and its history, so rich in glorious achievement and so replete with romantic traditions, can not fail in its appeal nor can even the casual observer be oblivious to the architectural marvels wrought through a devoted and reverent effort by the simple brethren to make their Abbey a physical manifestation of their faith in God.

It was here, in spite of the many foreign invasions suffered by Britain during the first thousand years of the Christian era, that the sacred traditions of the early church were safeguarded and held intact that they might be passed down from century to century as a worthy inheritance to all mankind. But, to the student of early history, no more wise counsel can be given than that he should use great care in arranging the results of his research under the classification of history, tradition, and legend. As to the first, little need be said, but greater care should be used in differentiating between legend and tradition. Legend is a fabulous narrative which may or may not be true and which has an element of haziness in its make up, interesting but not necessarily accurate. Tradition, on the other hand, is quite different, for in it we have the oral recounting from time to time of the actual history of the past and while there may be frequent inconsistencies or exaggerations, it is in the main founded upon facts which are so clear in their expression and in many cases so completely capable of substantiation that it would seem little short of recorded history itself. In those ages in which writing was little used save by the most learned and the news of the day was passed from mouth to mouth by travelling leeches and minstrels, visitors from other lands and troubadours, history and tradition must naturally have merged. Unfortunate indeed is he who is so incredulous as to be unable to see in many of our so-called traditions real truths which have come down to us through the ages.

And so, with this in mind, we find a link in the chain that binds our thoughts to the past when we read:

> "That Joseph came of old to Glastonbury
> And there the heathen prince Arviragus
> Gave him an isle whereon to build,
> And there he built, with wattles from the marsh,
> A little lonely church in days of yore."

Thus runs the poetic expression of an old tradition, the truth of which has been fairly well borne out by subsequent research, throwing an interesting light upon the early establishment of Christianity in the Western world.

Early Tradition and History

When, according then to this well founded tradition, Joseph of Arimathea was sent in 63 A. D. by Saint Philip as first Missionary of the Gospel to Britain, he with his son, also called Joseph, and a small band of early Christians came around the south coast, evidently with the intention of landing in Wales; but the conditions there appear to have been not to his liking for he soon retraced his way, finally landing near Bridgewater in Somersetshire, and from

there travelled eastward, along what was then the new Roman road, up the Vale of Avalon until he came to Glastonbury, halting just outside the town close to the Wirrall Hill. It was on this hill that Joseph is supposed to have thrust his thorn staff into the ground, and it, having been left there, rooted and blossomed each year at Christmas time, in honor of Our Lord. The legend seems to rest, to some extent, upon a botanical foundation, for it is very evidently a species of Mediterranean thorn and this variety is possessed of an unaccountable vitality; at any rate, certain it is that *to this day* the descendants of the Holy Thorn whose site on Wirrall Hill is now marked only by a plate, still hand down the miraculous story by blooming each Christmas, and though the snow may lie deep about the tree, its blossoms come to deck the altar of the old parish church.

Nor should we pass by another legend which has made a deep imprint upon history; it is that the Cup used by our Lord at the last supper was seized by the Roman soldiers and given to Pilate who in turn handed it to Joseph of Arimathea, and that it was one of the vessels used to wash the sacred body before it was laid away in the tomb. With a reverence that he alone could feel who had known and loved Our Lord and been with Him during the last sad months of His life on earth it was guarded with a holy fear, and borne by him to Britain. By it he was preserved from all evils, delivered from imprisonment and to it he owed his very existence. When, as an old man, Saint Joseph died, it was buried in Chalice Hill nearby and immediately there sprang from the spot a great stream of living water, which ever since has flowed for the cleansing and healing of all mankind.[1] By way of linking tradition and history we might say that it is well known that for hundreds of years pilgrims journeyed to this holy well, still called Chalice Well, to drink its health giving and purifying water, that a monastery was here built with a Hospice for the accommodation of pilgrims, that this Hospice is the same from which I write and that in the garden the beautiful Chalice Well is now supplying the whole township as, since the great drought all the city supply has gone dry. The solid masonry about the well is undoubtedly very ancient and over it is a cover, new but most beautiful, of heavy oak and symbolic iron work, given by the united offerings of the Nonconformist, Roman Catholic and Anglican Churches of the district.

Upon their arrival at Glastonbury, Saint Joseph and his band of followers were met by the British

[1]The officially attested records of all the wonderful cures effected by this spring in the XVIII century are preserved in the Library of the Incorporated Law Society in London, in a bound volume of Glastonbury MSS. —F. B. B.

chief Arviragus, who, seeing that their purpose was not conquest and that their strength was far spent, gave them a small portion of land upon which to settle (one "hide" to each of the twelve disciples, and to this day called the Twelve Hides of Glastonbury) and no sooner had these early missionary pilgrims been given an opportunity than they started to build the first Christian church certainly in England and probably in all the world. This they built with wattles or flat reeds from the marshes, woven in basketry form, the interstices packed with clay which, hardened by the sun, made a wall of remarkable durability. It was doubtless circular, with low walls supporting a cone shaped roof thatched with reeds, and measured less than twenty feet in diameter, and its site was the centre of what is now Saint Joseph's Chapel. This we know from the records of William of Malmesbury who was employed in the twelfth century in collecting evidences of early histories.

The reverence with which this little church was guarded, not alone by the early Christians but later by the invading Saxons and Normans, who were ever desirous of tearing down relentlessly what already existed and rebuilding larger and finer places of worship, is extraordinary, but it was in all likelihood due to a rather curious condition. In the early part of the seventh century, Paulinus, Archbishop of York, visited the old church which by this time was in need of restoration, and holding it to be a highly sacred place caused it to be encased in wood and covered with a roof of lead. Yet again, at a date the exactness of which is in doubt, a stone church was built over the two already standing, making in all what might be called three churches, one within the other. This it was then which marked the place as one to command the utmost veneration and stay even the ruthless hand of successive pagan hordes, and so the original wattle hut was still standing, in part at least, when in 1184 the whole was completely swept away by a devastating fire.[1]

While William of Malmesbury was engaged in his survey of Glastonbury he was shown by the monks there the original grant made by Gwrgan, King of Damnonia, to the old church in 601 A. D. conveying to it the land of Ynyswitrin, as that part of the Vale

[1]It was in August and September of this year that a most unusual circumstance led to the discovery of much valuable evidence in connection with these early edifices. While the writers have had the opportunity of examining this evidence and of being actually present at its discovery, they are not at liberty at this time to disclose its nature. Suffice it to say that it is in itself remarkable and when published, as it will be shortly by Mr. Frederick Bligh Bond, F. R. I. B. A., the Director of excavations at Glastonbury, it will be of enthralling interest to both architects and archeologists.

of Avalon was then called. In spite of the fact that the parchment was almost illegible from age and contained many archaic characters making it most difficult to read, he considered it, as did the monks, a most valuable document. It alone seems to have been the only evidence of a documentary nature which the Abbey possessed dating back to Celtic times, and is the first bit of actual history, quite apart from tradition, that has come down to us concerning the old wooden church built by Paulinus, and as this grant was coeval with the coming of Saint Augustine and his Benedictine missionary monks, it marks the beginning of the monastic order in Britain.

The years which witnessed the erection of the three early churches also saw, immediately to the east on what was later the site of the nave of the great Abbey itself, another church begun by Ine, King of the West Saxons in 708. This was altered, added to, torn down and rebuilt time and again during the successive abbacies of Saint Dunstan, Turstin,—wretched monster—Herlewin, Henry de Blois and Robert; unfortunately, there is very little evidence to guide us in picturing to ourselves what this church was like and its existence, in addition to the church immediately to the west, is accounted for by the fact that, whenever we find the monastic system existing at that time in England, the monks lived and worshipped in small units rather than in large communities as did the Benedictines in other countries.

Progress and Development

On the 25th of May, 1184, the fire, already referred to, swept before it all the Abbey buildings, both religious and secular. Still, notwithstanding the fact that the loss was great, especially because of the destruction of many records of value, it was not an unmixed evil.

The Abbey was at this time in the custody of Henry the Second and it was under his guidance and that of his Chamberlain Fitzstephen, that the great scheme was laid which resulted in the building of a church the present ruins of which give eloquent testimony to the creative genius of the Benedictine brothers. But, had this genius been the master element in the building much that was done would never have been conceived. Only great love and a divine fervor could have inspired that noble proportion, that glorious sweep that must have lifted the soul with the eye, from portal to high altar, and everywhere, from the bases of the great piers with their carefully fitted parts to the smallest detail of exquisite carving, we see the patient, skilful hand of an artisan who prayed as he labored on towards

the ultimate perfection of his ideal. Even the ruins of the Abbey are far too vast and too rich in detail to admit any consideration of them in their entirety within the space of a short article. If we are to see them with an unconfused vision each part demands careful study, but to the student who approaches in a reverent spirit the mutilated but still glorious fragments which remain, there comes a rich reward.

No sooner had the shock of the great fire passed than rebuilding was commenced. It is probable that the foundations of the Chapel of Saint Joseph were laid no later than the very year of the fire, for according to Adam de Domerham, the chapel, though not completed, was dedicated by Reginald, Bishop of Bath, in 1186 or 7. It is at the extreme west end of the Abbey and a direct line from its west wall through the great nave to the eastern or apsidal foundation of the Edgar Chapel measures a distance of 592 feet—an unequaled vista!

For a short time St. Joseph's Chapel stood as an isolated building but was later connected with the main structure by a continuation known as the Galilee, part of which, a splendid fragment, still stands. That the "ecclesia major" or Great Abbey church was started about the same time as the above chapel is proven by a charter of Henry the Second signed in 1184, but no sooner had the work been well started than misfortune once more overtook it, in the deaths at almost the same time, of Henry and the able Fitzstephen, bringing, through lack of funds as well of change of government, an almost complete suspension of all building, painful and irksome though it was to the pious brethren. However, in 1235 work was once more in full swing under Abbot Michael de Ambresbury, who is accredited with the completion of the choir and transepts as well as many of the secular buildings. From these last, once an important part of the Abbey foundation, we are able to form some idea of the activity that existed within its walls. It is natural to think of the Abbeys of medieval times as centers of religious teaching where no more secular work was done than that which had to do with the beautifying of the church and its services. This however is far from correct as most of the larger Abbeys, notably St. Edmund's and Glastonbury, were great industrial centres in the times in which they flourished. According to St. Edgar's law it was required of each priest that he learn some handicraft, consequently each Abbey had its own smiths, stonecarvers, carpenters, masons, fishermen, huntsmen, and farmers as well as artists, writers, and musicians; and it is not unreasonable to believe that this communal living was directly responsible not only for the great

service that the Abbey gave to the world but for the existence of the splendid church itself.

Nowhere, perhaps, do we find a more complete fulfillment of St. Paul's injunction that the followers of Christ be "given to hospitality, distributing to the necessity of the saints," for it was here that the pilgrim was ever sure of aid, both temporal and spiritual, if he but made his wants known. However, it was not alone the casual wayfarer who availed himself of the privilege of the Abbey's hospitality, and we read repeatedly of the visits of kings and queens, nobles and gentlemen with vast retinues, all requiring housing in one of the guest-houses attached to the monastery. History tells us that in 1278 King Edward and Queen Eleanor spent Easter there and the following week under his direction the bodies of King Arthur and of Guinevere his Queen were removed from the south side of St. Joseph's Chapel and reinterred in the choir of the Abbey close to the high altar. (NOTE—Mr. Bligh Bond is disposed to believe that their bodies were interred at this spot, which he has located with some precision, by the discovery of what appears to be the foundation of the more westerly of the two "Pyramids" between which, as old chroniclers aver, their remains were laid, and in a public lecture on the 17th of September, 1921, he asked those present to witness that he had so marked the spot.)[1] In other parts of the Abbey were the tombs of the two Kings Edmund, and of Saints Dunstan, David, Patric, and of that Edgar who was both King and Saint. No wonder that to a place so endowed with holy relics the rich poured out their treasure and the poor their love, so that in the three hundred years that followed the Abbey became more and more majestic, more and more glorious, until it stood the most beautiful religious edifice, perhaps, in Europe, as well as the richest, both in relics and in treasure. From Saint Joseph's Chapel on the west to the Edgar Chapel at the east end of the splendid vista nothing was spared that could beautify and adorn, and yet all was so well applied and with such nice judgment that nowhere was there given an impression of over-abundance of detail. Under the next-to-the-last Abbot, the famous Richard Beere, were built the superb inverted arches, like those still to be seen at Wells, and he it was that began the Edgar Chapel as well as the Loretto, the result of a vow taken upon his deliverance from danger while on a pilgrimage to Rome. These two chapels have an especial interest to us today owing to the recent discovery of their foundations by Mr. Bligh Bond under most extraordinary circumstances, references to which will be made presently.

In 1524 Beere died and was succeeded by the last Abbot, Richard Whitting, whose martyrdom was the sad ending of a great chapter in ecclesiastical history. Under Whitting, who had formerly been a master in the Abbey school, the educational work begun by Beere was carried on, no less than 300 sons of the nobility and gentry coming under his influence and teaching during their training for the priesthood. However, in 1539, the greedy eye of Henry the Eighth fell upon him with displeasure and since the royal coffers needed replenishing and the riches of the Abbey were great. he and all that he stood for were marked for destruction. We read, in Thomas Cromwell's notebook for the day, "Try, *convict and execute* Abbot Whitting."

The patriarchal old man, in company with his two treasurers, was tried, then, at Wells and being condemned to death, was dragged on a hurdle from Wells to Glastonbury, a distance of about six miles, and next day hung, drawn and quartered. Over the Abbey gate the venerable head of the old Abbot was set and parts of his body sent to Bath, Wells, Ilchester and Bridgewater, there to be displayed, so that all might see what the royal displeasure meant to one who held his God above his King.

No sooner had its last Abbot passed to his reward than the Abbey, with all its buildings, was seized by the King, who sold the property bit by bit, after letting who would wreck and pillage. The pendulum of reform had swung and, swinging, had become so violent that before it had resumed its normal position such damage had been wrought that it is impossible now to look at the poor battered ruins without a sense of deep humiliation because of the wanton destructiveness of man and of his merciless sacrilege.

Many buildings in Glastonbury town have been made of the stone taken from the walls of this venerable House of God; what seems even worse, load after load not only of the masonry of the church itself but most beautifully carved bosses, corbel heads and gargoyles, were thrown, as so much debris, into the roads, where they were broken and rolled down into paving. So was made the road between Wells and Glastonbury! This process went on, under successive tenants, for over 200 years. An old villager to whom we spoke had paid a shilling a load for as much as he cared to cart away.

In the reign of King Edward the Sixth, the property still being under state control, was in the custody of the Duke of Somerset, protector to the young King, but neither could he stay his relentless hand for it was then that the leaden roof of the great Abbey was stripped off and sent to the Island of Jersey to make a covering for the Castle of Mont Orgueil. Marson in his history of Glastonbury tells us that "the furniture, locks, doors, glass windows, iron and timber were sold at nominal prices. The carved

[1]It has been suggested by some writers that the "discovery" of Arthur's bones was a good stroke of Royal policy, inasmuch as it tended to set at rest the myth of Arthur's predicted return, which was disturbing to the reigning dynasty.—F. B. B.

wood hacked to pieces . . . the stones were sold in cheap cartloads for all purposes. Worst of all, the books and manuscripts of the matchless library were sold by weight to binders and grocers; torn up and used for parcels, fires and every dishonest purpose. The poor stole handfuls and the rich filched farms and manors."

It is not without gratification that we learn that the scarred and wounded remains of this sometime glorious Abbey have recently passed into the possession of the Church of England, there to find, let us hope, a guardianship which shall be safe both from the marauding hand of man and the rapacity of the souvenir-hunting tourist. Nor is this all, for during recent years, architects and archeologists have made many conscientious efforts to procure a sufficient amount of information as to the exact location of the foundations of the missing walls and chapels of the Abbey and by study and inference to obtain a reconstructed plan and elevation of the church as it was in the sixteenth century. However, the results of this research proved to be contradictory and in many cases contained so many misleading discrepancies that it was not until 1908 when Mr. Bligh Bond began his study and consequent excavations that much information was to be had of unquestioned reliability.

While in this narrative we are chiefly concerned with the history of Glastonbury, an extraordinary chapter of circumstances which led to the establishment and verification of many facts, concerning which there had long been much uncertainty, may justify what would seem to be a departure from our subject. But, in view of the results, these circumstances have a valid claim for our consideration in any account of Glastonbury, however brief and imperfect. It is not the intention of the writers to enter into any discussion as to the psychic whys and wherefores; it is for them to tell the reader the facts and leave him to form his own conclusions.

The exact size and shape of both the body and the east end of the Edgar Chapel, as well as its true position, have been the subject of much speculation on the part of archeologists, architects, and writers for many years, and widely divergent opinions have been advanced, some showing one plan, some another, but *all* of which subsequent developments have proved to be incorrect. It was with this baffling and unsatisfactory information that Mr. Bligh Bond, as Director of Excavations, approached his work, and it seemed that if any premises worth having were to be got, they would have to come from some other source than those meagre and conflicting ones already recorded. It was at this point that he suggested to his friend John Alleyne that the appeal to the psychic power latent but still existing in the mind of man, if he but be in harmony with the world of spiritual phenomena, might be productive of information that would reveal some of the hidden treasures which for so long a time had been obscured because of a thinking principle so material as to be unable to lay hold of the higher functions of which it was capable. But as to the best method to pursue in readjusting their habit of thought from mere logical deduction, based upon what had already proved to be rather doubtful evidence, to the employment of a psychic principle, was a difficulty that must be met.

It occurred to F. B. B. (Mr. Bligh Bond) at this time, that the faculty of automatism which J. A. (Mr. Alleyne) was believed to possess might be the means of solving many of the problems and eventually prove to be the key which would unlock a door leading to many hitherto closed channels of information. It was not, however, during any of their first endeavors, at which they thought they might perhaps receive communications from outside forces by means of automatically written messages, that anything of value was obtained, and, had it not been for the unbounded patience of these two men, the last chapters in the history of Glastonbury would have been vastly different from what they are. Those who wish to follow more in detail the story of this practical application of a psychic phenomenon, which is beginning to be recognized by many undoubtedly sincere scientists, can do so by reading the report of it in F. B. B.'s book, "The Gate of Remembrance," the fourth edition of which is just out. Within the limits of a magazine article we must content ourselves with a very scanty outline of the extraordinary results obtained.

In order that there might be a complete isolation between a material mental activity and any psychic force that might exert itself, and to leave the latter the most complete freedom, F. B. B. either engaged his friend in general conversation, or else read aloud an absorbing novel or, at one time, a history of Japan, holding the book in one hand, while the fingers of his other rested lightly on the hand of J. A. The only physical force used was when at the end of each line F. B. B. lifted J. A.'s hand back to the left side of the paper. At the end of each sitting the reader questioned J. A. carefully about what he had read so that each might be assured that his mind was wholly centered on the reading to the absolute exclusion of the script.

It became evident before many meetings such as those described, that there were those in a spiritual existence, entirely apart from the material world, who not only had an intimate knowledge of and a great love for the Abbey, but were as anxious to communicate their information and offer their assistance as were F. B. B. and J. A. to receive it. Much of the script produced was in what F. B. B. himself calls "ragbag Latin" of a monkish sort, sometimes a

curious mixture of Latin, early English and even old Norman. The first message of importance was a tracing of the ground plan of the Abbey, showing a rectangle projecting from the east end, which was at once recognized as part of the Edgar Chapel. It had all the marks of a drawing that might be made by one blindfolded, done in one continuous line and ending with the signature "Guliemus monachus" across the face of the sketch. This, while important, did not give sufficiently definite information. F. B. B. accordingly asked:

"Please give us a more careful drawing of the chapel at the east end of the church."

In answer a new sketch appeared of the rectangular part of the chapel, also indicating in a labored way two smaller chapels on the north. Below, in cramped characters and most difficult to read was:

"Capella St. Edgar. Abbas Beere fecit hanc capellam . . . Martyri et hic edificavit vel fecit voltam . . . fecit voltam petriam quod vocatur quadripartus, sed Abbas Whitting . . . destruxit . . . et restoravit eam cum nov . . . multipart . . . nescimus eam quod vocatur. Portus introitus post reredos post altarium quinque passum et capella extensit 30 virgas ad orientem et viginti in latitudine cum fen (?) . . ."

F. B. B. "Please give length again."

Answer. "300 virgas . . . et fenestrae (cum) lapide horizontali quod vocatur transome et vitrea azurea; et fecit altarium ornat (um) cum auro et argento et . . . et tumba ante altarium gloriosa aedificavit ad memoriam Sanct . . . Edgar . . ."

F. B. B. "Which Abbot did this?"

Answer. "Ricardus Whitting . . . Ego Johannes Bryant Monachus et Lapidator."

So intimately has "Johannes" become associated with the recent excavations that his name has been a curious inspiration both to those actively engaged in the work of discovery and to those who are only interested observers. Not only of a technical or informative nature have been the communications from him for at times they have led us through by-paths into charming philosophical fields. The following, quoted in part, was in answer to a question as to when the work of excavation should be begun:

"Wait, and the course will open in the spring. You will learn as you proceed. We have much to do this season . . . For greater things will rise into being—great nations and great ideals. We work for it. Be willing, and strive not against the tide. Up on the crest and prosper. All will work for the best . . . The spark will live through the rains and re-light dead fires, fire which is still fire but with

purer flame. We can not hasten this time but it is sure and is not delayed . . . Keep open ears for spiritual help and whisperings. Assimilate and combine both forces. Stand in the market-place and cry your wares but listen for the still small voice in the silence of your chamber. Work in the sun. Listen in the starlight . . ."

The following, quoted in part, was received several months before any work of excavation had been begun:

"And beyond rose a Capella of Edgar ye sainte, faire and high with grete windows with transomes and between ye windows were pillars as panellae the whych did holde ye roofe of stone vaulted very faire in panellae which were fanwise very fine much like carven ivorie . . . And ye chamber was in length seventy feet in four bayes[1] . . . and ye walls were thin and all of squared stone and new carven . . . and yt was ybutressed with faire butresses and walls slantwise at ye corners."

These facts, unusually thin walls, heavy buttresses and walls set at an angle have been found to be exactly as stated, although nothing existed to testify to these facts. Later messages on the whereabouts of the Loretto Chapel have been confirmed in this new edition of the book, the excavations of this year having completely proven the veridical nature of the communications received years before. But what was to the writers the most important discovery of all was made in September of 1921, when we had the great good fortune to watch something uncovered, exactly in accordance with a script previously received and shown us, which when published, as it will be shortly, will prove as far as such a thing is possible that there is a storehouse of forgotten things that can be made to yield its treasure to those who have a right to know.

In this case, during a period of nearly thirteen years, the net result has been a deal of remarkable information, some philosophical or metaphysical, but that which concerns us for the moment pertaining to life in the monastery, to which is added much that is technical and a good deal historical. By dint of careful translation and putting together of the fragmentary parts we now have a fairly accurate knowledge of the life in and history of the great Abbey and when one weighs the evidence in the light of what has actually been accomplished, one can not pass by what has been done by these two men in an effort that is honest and sincere.

At no time during the writing of these notes has it been the intention of the writers to hold any brief for or against the psychic element that enters into this narrative; they simply aim at bringing to the attention of the reader such facts of a veridical nature as seem irrefutable.

The result of the exhaustive study and of the excavation carried on during recent years has been something of far greater value than the mere strengthening of many traditions and legends: it has established in no uncertain way numberless hitherto cloudy conceptions of church and secular history which can not but be of great value in times to come.

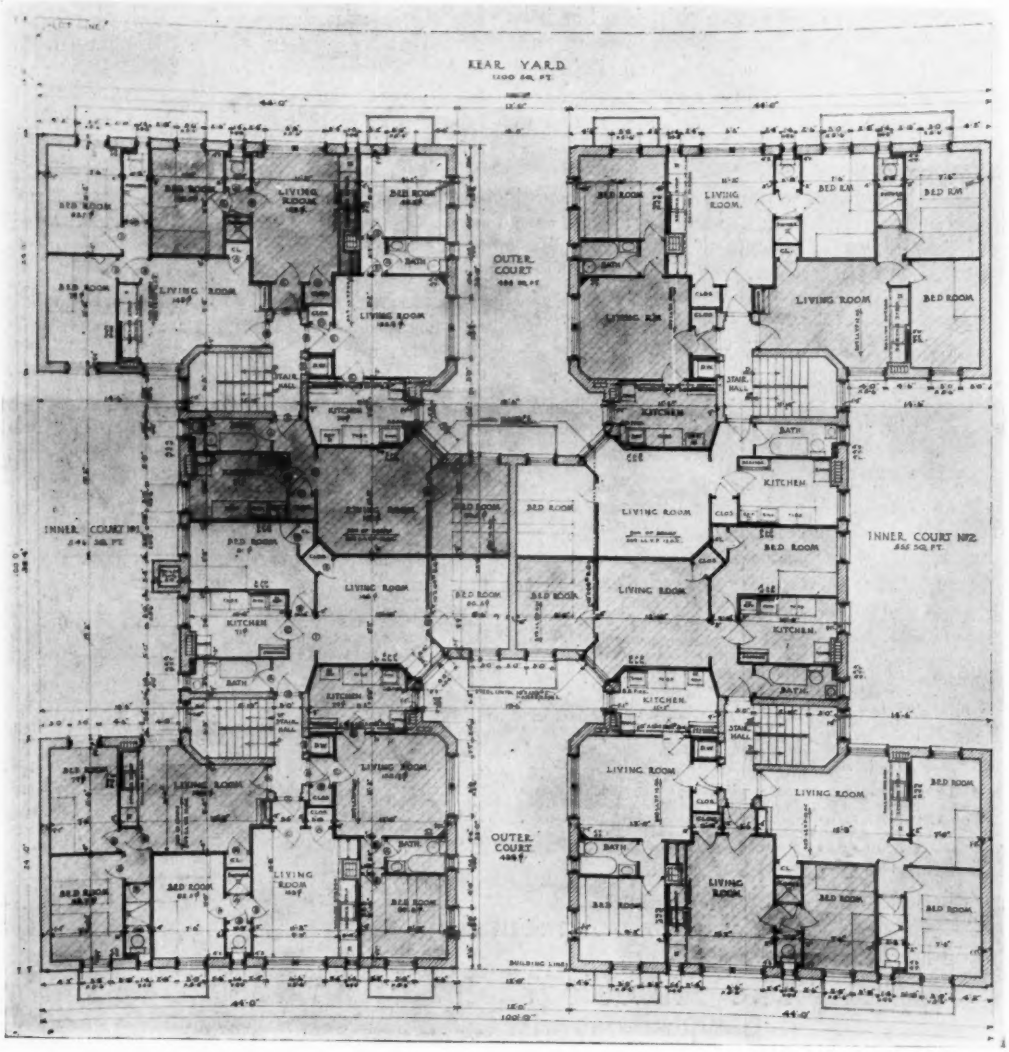
[1]Given with greater precision in a later script as 72 feet, which is stated to be the length of the part which Beere built—the further extension being Whitting's work. All this is new to history, and cannot be inferred from any existing document. All has been verified by excavation, and the writing was given some months before discovery.—F. B. B.

Announcing:

"The Autobiography of an Idea"

By LOUIS H. SULLIVAN

It is our proud and happy privilege to announce that beginning in a very near issue THE JOURNAL will begin the serial publication of a work by Louis H. Sullivan. In the "Autobiography of an Idea" as Mr. Sullivan has elected to entitle his work, which promises to run through twelve or more numbers of THE JOURNAL, he will develop that idea out of which grew the architectural achievements which have given Mr. Sullivan's name a unique place in the annals of American architecture. We doubt very much whether an architect has ever before set out to elucidate a theory or idea or visualisation of architecture by an autobiographical process. Whether our premise is correct or not matters little however. Mr. Sullivan has a tale to tell and a manner of telling it such as will mark an eventful circumstance in the literature of architecture in America.



First Prize—Sibley and Fetherston, Architects

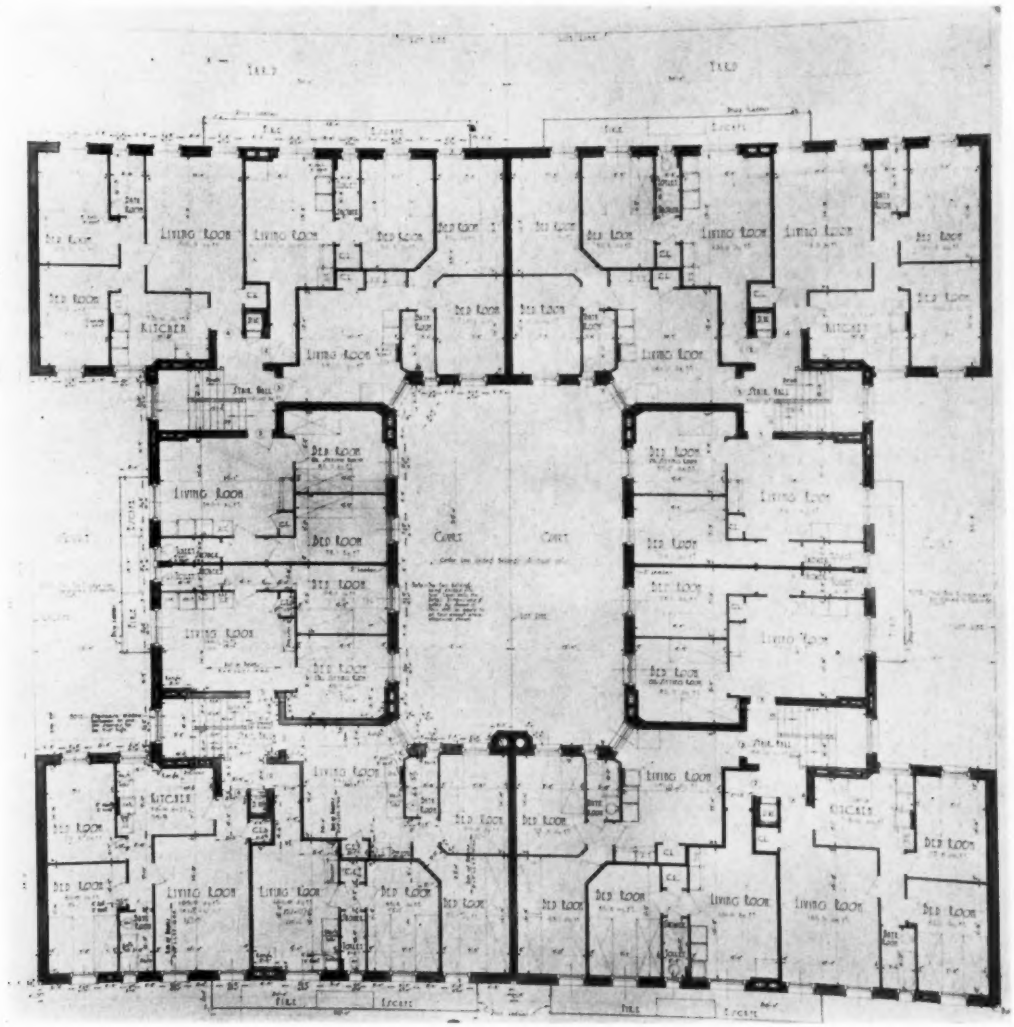
The Phelps-Stokes Fund Tenement House Competition

By FREDERICK L. ACKERMAN

The final Competition for Plans of Model Tenements, made possible by the Trustees of the Phelps-Stokes Fund, resulted in the award of first prize to Sibley & Fetherston, who become as a consequence the architects of the first 100′ unit to be erected by the Trustees. Frank J. Shefcik won the second prize of $1,500; John Tompkins the third prize of $1,000; Raymond M. Hood was awarded $100 for his plans in the preliminary competition, which showed certain interesting features.

This is the fifth Tenement House Competition of note held in New York. Our first tenement house competition was held in 1879, for buildings to cover approximately 75 per cent of a lot 25 feet by 100; four apartments of three rooms each per floor; no baths; two public toilets. One hundred and ninety architects were in the competition. The first prize was won by a well known architect with a plan later known as the "dumb bell." His design came into general use in New York and has been extensively copied elsewhere. Out of the wretched conditions caused by the use of this type came the long campaign which resulted in the passage of the tenement-house law.

A second competition was held in 1896, a third in 1900.



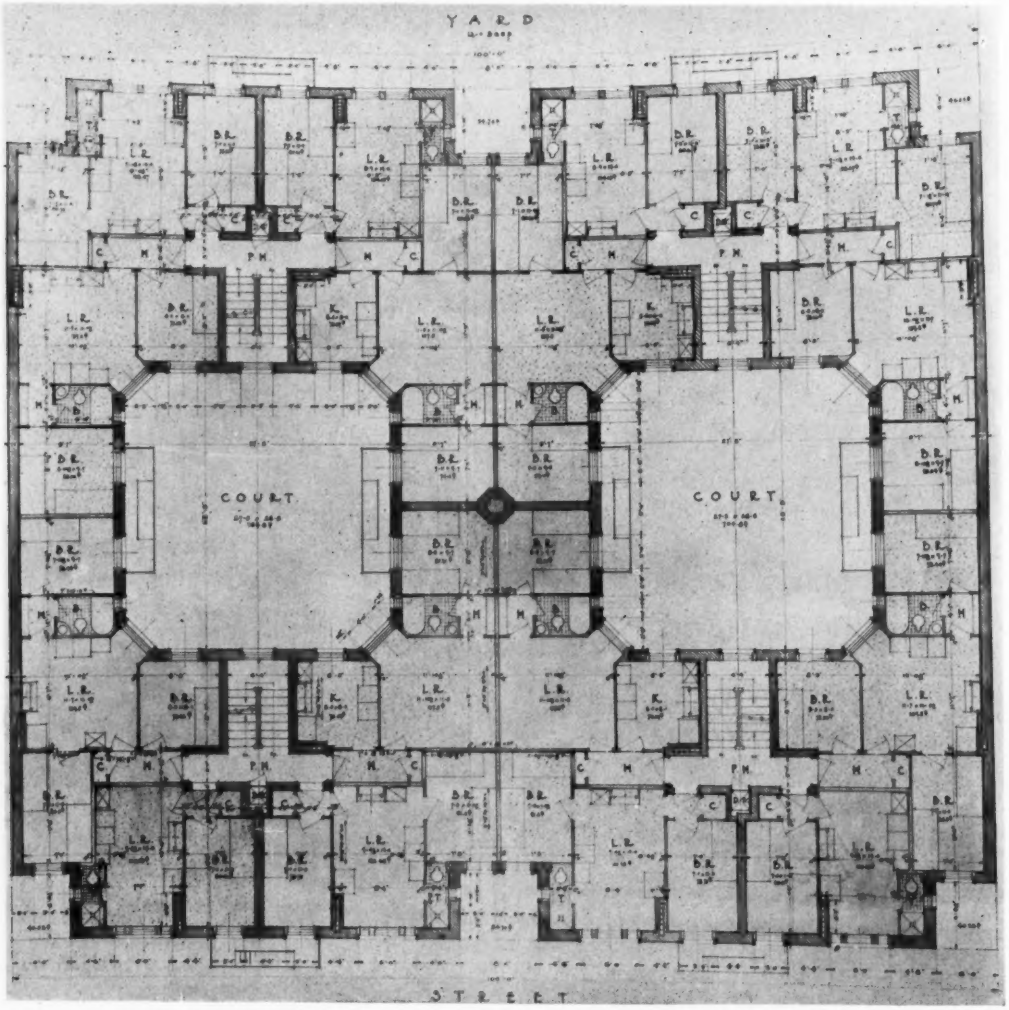
SECOND PRIZE—Frank J. Shefcik, Architect

In the latter, buildings were to cover approximately 70 per cent of inside lots, 25, 50, 75 and 100 feet wide by 100 feet deep. The first-prize design, for a lot 100 feet wide, contained six four-room and four five-room apartments, or forty-four rooms per floor; no baths; a toilet in each apartment.

"The competition of 1920 had as its object an attempt to undo the result which came from general use of the premiated design of 1879, also, of course, the work that had preceded it. The problem was how to remodel and show a profit. From this competition no action resulted."

So much history is recalled since it is of importance to check at this time what progress has been made over half a century. Concerning this point it may be said that the generally accepted standard of what is viewed as tolerable congestion now stands about where it stood thirty years ago. There has, in fact, been but slight change in half a century. This is said of the programs: and a comparison of the designs of twenty years ago with those of 1922 bears out the statement that the art of planning as revealed by these competitions has not advanced appreciably in twenty years. From the terms of the programs and the drawings in competition we see plainly that the point of view as to what constitutes the "Problem" has not shifted at all. Now as ever before, it is a case of fixing a limit to the area of the building in terms of per cent of area of lot which approximates that established by law (70%) and which is rigidly adhered to by speculative builders. The "Problem" is always confined to the arrangement of rooms, etc., within a given area.

But this competition was ushered in under circumstances which differed from those which occasioned former com-



THIRD PRIZE—John Tompkins, Architect

petitions. As a consequence of studies made by A. J. Thomas[1] it was felt by some that there were financial as well as social gains to be had from building over a smaller percentage of the lot than in the usual case. The point was discussed at a meeting of the New York Chapter; a committee was appointed for the purpose of checking up this theory. If it were found that it was financially advantageous to build over a smaller percentage of the lot, then the matter was to be laid before the loaning institutions in the hope that they would give preference to superior plans.[2]

But the outcome of the effort was not precisely what had been anticipated. The outcome was the competition first referred to which called for the usual thing—designs covering approximately 70% of the lot. The problem again was the arrangement of rooms.

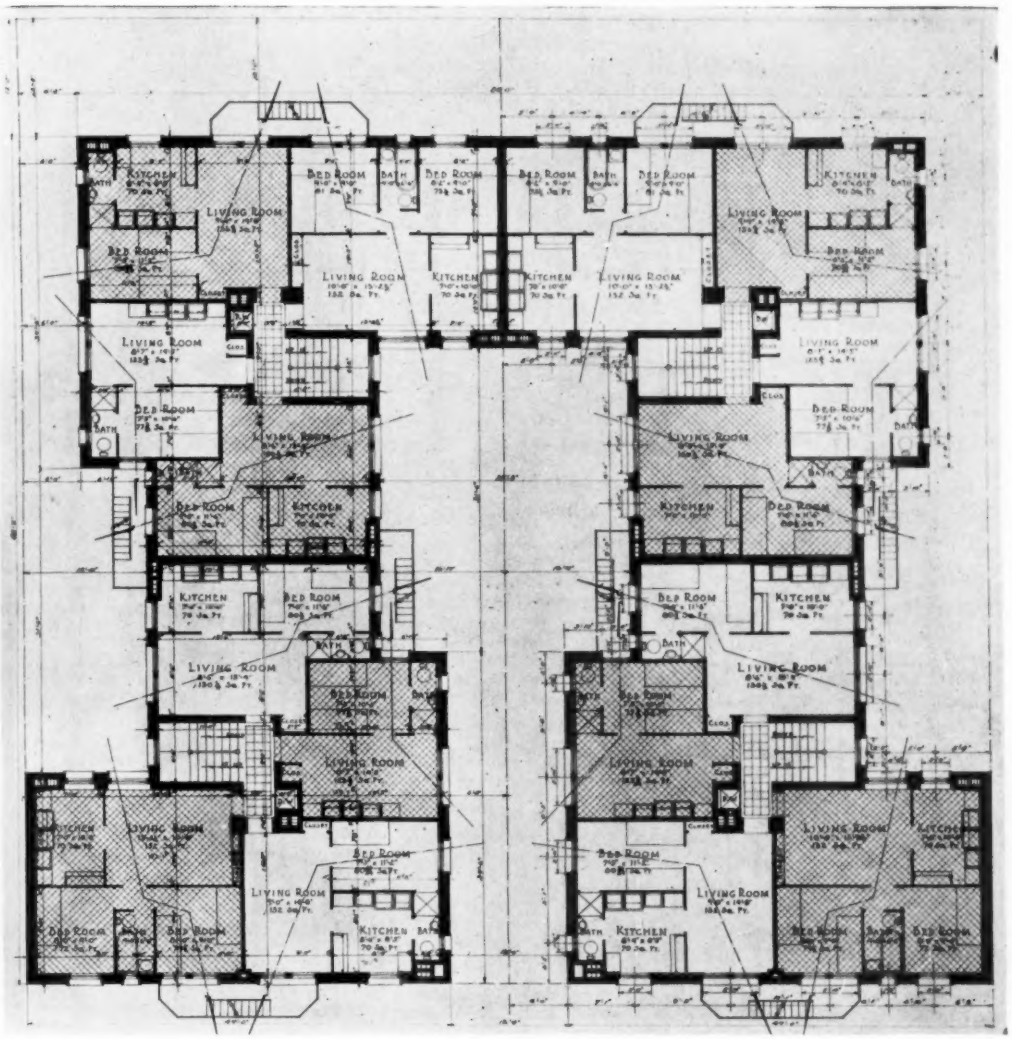
[1]See previous articles in JOURNAL.
[2]See A. I. A. JOURNAL of November, 1921.

And the purpose of that clause in the Program which asked for the submission of alternate plans suggesting modifications in the Tenement House law was clearly expressed by Mr. Stokes in an interview published in the *Evening World* of 14 February.

"'The most radical change, and the one I suggested twenty-one years ago,' he said, 'is the elimination of the limit of 70 per cent placed upon the percentage of the lot upon which the man may build. It is absurd to place any limit to the area to be covered by the building when the law provides that every room should be lighted and receive air from proper sized courts. Further restrictions are unnecessary. They serve to restrict the ingenuity of the man who can get these same conditions and still use the land more economically.'"

But suggestions of this sort were not forthcoming. Evidently there were difficulties in covering 70%.

The writer discussed the question in "The Survey,"



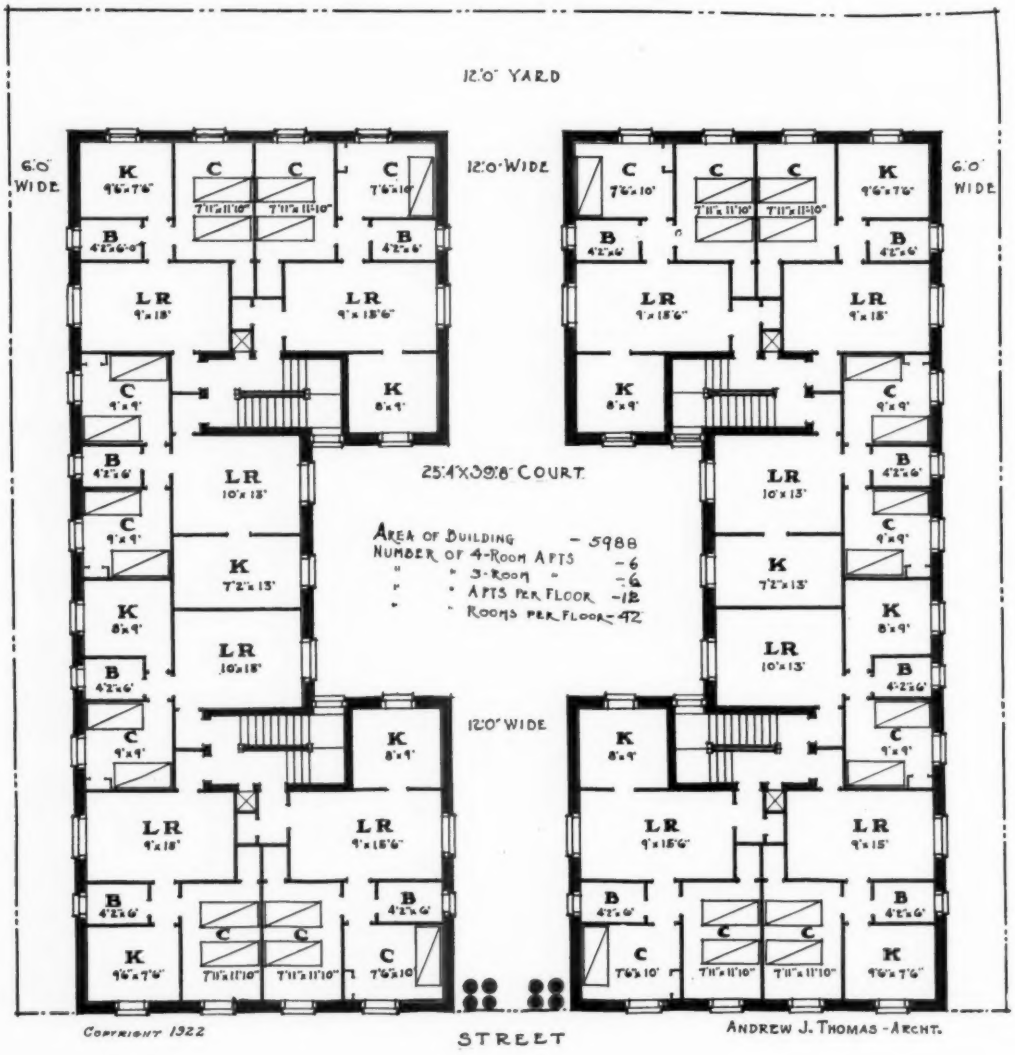
SPECIAL HONORARIUM—Raymond M. Hood, Architect

24 December, 1921. Mr. Stokes contributed a rejoinder to which the writer replied in the same issue. The question is now brought to the readers of THE JOURNAL by reason of its significance. For if the conclusions are correct, then the accepted standards set up in our building regulations and zoning ordinances as to area covered by habitations are too high.

There is no space here to go into a detailed discussion as to why this or that design was premiated. It was as the nature of the program required, a judgment based upon a comparison of minute details. The economics of the problem were not treated; they could not be treated; the competitors in making their plans and the jury in judging them were confined to arranging 46 or 48 rooms on a lot 100 feet square, or half that number on lots 50′ x 100′, and of covering approximately 70% of the lot. So therefore no reference will be made as to whether the kitchen fixtures should be in a small Kitchen, or in the Living Room, or arranged in a kitchen "strip" to be concealed behind doors in the Living Room; or whether corner lighting is better than some other kind of lighting; or whether showers or tubs, etc., should be used.

For the problem is not how to adjust these details. It is a matter of block sub-division and the maximum area which it is financially advantageous to cover.

So I will pass over the relative merits of the three premiated designs. For the time being, discussion of details is beside the point. I shall make reference, beyond the Prize Design by Sibley & Fetherston, to the plan by Raymond M. Hood, since the Hood plan serves best, among those in the final competition, to illustrate the point. I shall also refer to a drawing by A. J. Thomas, based on one



presented in the competition but which contains four fewer rooms than required by the competition program. In the following calculations I use the current assumptions. Cost of land, $10,000 per lot of 25 ft. Buildings, six story "walk up," 70 ft. high at 35 cents per cu. ft. Average rental per room $8.00 per month. For simplification, the first floor is treated as typical. Sundry additional costs are not included.

Comparing the Prize Plan with the Hood Plan we have the following:

Prize—Area	6,831	sq. ft.	46	rooms	per	floor
Hood— "	6,355	" "	48	"	"	"
Difference	476	" "	2	"	"	"

Prize—Building Cost—	.....	$167,359.00
" Land "	.....	40,000.00
" Total "	.....	$207,359.00
Hood—Building "	.....	$155,697.50
" Land "	.....	40,000.00
" Total	.....	$195,697.50

Difference in favor of Hood, $11,662.00.

But the Hood plan has 2 x 6 or 12 more rooms which at $8.00 per month produce an income of $1,152. This income capitalized at 12½% amounts to $9,216.

This suggests that one might add another 25 ft. lot at $11,762.00 and so open up the plan while still retaining the advantage of the income from the 12 extra rooms.

While this may not appeal to the speculative builder, there is surely something in it for the co-operative group who are interested in light and air. Or if one wished to open up the plan upon the same plot it would be possible to do so by eliminating rooms.

Let us cut a 4 room apartment with its proportionate area, leaving the gross area of such a modified plan at 5,823 sq. ft.

Following the same methods of calculating as above, we have:

Prize—Land and Building	$207,359.00
Hood (reduced) and Land Building	182,663.50

Prize building containing 276 rooms at $96.00 per year produces an income of $26,496.00.

Hood building (reduced) contains 264 rooms at $96.00 per year produces an income of $25,344.

We therefore see that the Prize Design produces 12.7% gross income while the Hood design (reduced to 58.23% of lot) produces 13.8% income.

Before drawing conclusions let us see how it works out with a design by A. J. Thomas. The plan referred to here was not in the competition. It is the same scheme as was submitted in the preliminary competition but with 42 instead of 46 rooms per floor. If used in a block development the side courts open up to 12 feet between buildings. It is here used in comparison with the Prize Design, since when the two isolated units are reversed in position we have a form which compares with the Prize Design, but with this important difference: all courts extend through from front to rear. The area of this plan is 5,988 sq. ft. per floor of 42 rooms. Comparing this with the Prize Plan we have:

Prize—Land and Building	$207,359.00
Thomas " " "	186,706.00
Difference	$20,653.00

But the Thomas Plan contains 4 less rooms than the Prize, which would reduce his income by $2,304.00 per year.

This deduction leaves a margin in his favor as the following tabulation shows:

	Land and Bldg.	*Gross Income.*	*Per Cent.*
Prize	$207,359.00	$26,496.00	12.7
Hood	195,697.50	27,648.00	14.1
Thomas	186,706.00	24,192.00	12.9

In the above comparisons no account has been taken of equally important matters. No more than the most superficial study of the several types will disclose that the Prize Design is the most expensive type to build. In this respect a comparison of the Prize Design and the Thomas Plan is startling. In the Prize Plan the exterior walls and partitions twist and turn like an irregular coast line; walls turn at 45 degrees, partitions at odd angles. Stair enclosures are extended into little hallways; steel beams, resting in turn upon lintels over windows, carry the joist. The length of walls and partitions is beyond all reason in relation to the areas enclosed by them. In fact, there are few areas and volumes within the plan which are not surrounded with complex construction. And the Prize Plan is too "tight." Dimensions for stairs and rooms in too many cases permit of no errors in laying out the lines of construction; any variation reduces the space below that allowed by the law. Any plan, to be executed economically, must take into account the inaccuracies of actual building and allow for the same. It is in respect of straight-away construction that the Thomas plan points out what should be the aim of the designer in planning buildings of this sort. At no point in his plan does he impose a structural problem. A simple plan means lower cost; much lower where the differences are so obvious and striking as in the case of the two last referred to. This is not debatable.

While no account has been taken of the location of stairways, one may not ignore the advantages of so locating them as to retain the typical arrangement on the ground floor. Here again the Thomas plan is superior; no rooms are lost; no variations are imposed upon the process of erection.

Where to locate the unoccupied area—the open spaces—is not so easily disposed of. The solution is bound to turn in a given case upon what stands adjacent to the plot. It also turns upon whether we are dealing with a single plot or a block development.

The Thomas plan in the preliminary competition came in for harsh criticism because of his 6′ side courts. But it was apparently completely overlooked that by reversing his units in the case of walls on the building lines on either side, we have a form of plan similar to the Prize Design but with this important difference: the courts all carry through from front to rear; there are no confined inner courts, no dead end pockets. A through circulation of air is secured every 50 feet.

One can not possible ignore the value of this. As a scheme for plot development it would produce a far more satisfactory condition than would be the case with the Prize Design. As a block development plan it is certainly superior. Again I think that the Thomas plan points the direction for further study.

There is no space here to extend the discussion of details; but the reader should compare such conditions as shape and size of rooms; location, type and arrangement of bath rooms. In no case does Thomas fail in providing the desirable articulation of bath, sleeping rooms and living rooms. In the same way a comparison with respect to maintenance, insurance and fire risk points to the conclusion that simplicity and lower covered area scores.

The outcome of this analysis should not mislead the reader to the conclusion that I am an advocate of any of these designs as a "solution." The purpose was to analyze the outcome of the Phelps-Stokes Fund Model Tenement House Competition in the light of the knowledge now available and applicable to the use of those who for one reason or another erect tenement houses on land which costs from $4.00 per sq. ft. or $175,000 per acre up.

Fifty years ago we tried to turn the trick on 75% of the lot. What followed our effort in twenty years was the great American slum. Then we tried 70% of the lot. From the results obtained then, from what followed and from what we did yesterday it looks very much as if we had missed the point. For it looks as if the complications in construction, the waste labor and materials, which appar-

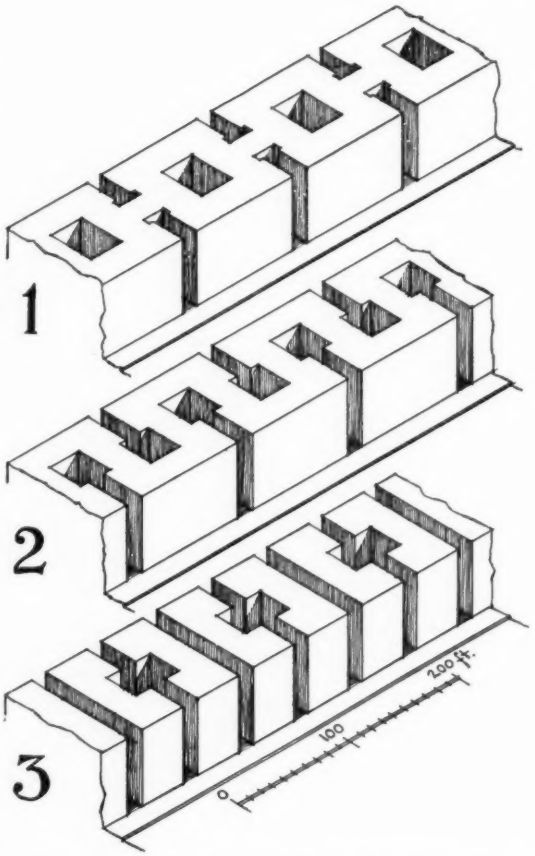
ently follow upon the heels of every effort to cover so great a percentage as 70% can not be avoided. It suggests that we should look into whether it pays to cover so much land regardless of its price. Apparently it does not.

A glance at the isometric block suggests the sub-title under it. But then I realize that a large percentage of one-half of our entire population must find their houses in habitations of this sort. And knowing something of the actual circumstances and the point of view of those who so have to live, I move over to a liberal position. I say to myself, under the conditions of land values—one hundred, one hundred fifty, two hundred thousand dollars per acre, the architects can provide more light and air if they were but given the opportunity. Will they be given the opportunity? That is the point.

And if they are given the opportunity, what then? I am not fooled by my own calculations for I know that, unless these building ventures are completely co-operative the gains made in terms of light and air will be charged for and capitalized in terms of price. The gains made, though they cost nothing, may be secured by those who live in the better designed buildings only upon one condition, viz., that they have the ability to pay more.

Which is a radical way of viewing the matter. But how else can one view it? For it is merely stating the facts of the case. Twenty years ago the "problem" of housing in congested areas of Manhattan was discussed in terms of 25 ft. lots at $5,000 to $7,500 per lot. Now it is ten, twelve, fifteen thousand dollars per lot. In what terms will we be dealing twenty years hence? This is a question we must face.

But I am told that all this falls outside the province of the architect; that it is a matter of economics. I do not follow. If the habitations of a large percent of one-half the population falls outside the concern of the architect, then it follows that architecture is not so vital a matter after all. Which perhaps is the proper view to take. All depends upon what we do; action and not dialectic discussion will settle the question and place the profession where it belongs in the ever changing scheme of life.



The three types as they would appear in block developement.—1. The Prize Plan. 2. Mr. Hood's Plan. 3. Mr. Thomas's Plan. After many thousand years of progress man has gained such mastery over the material world that a large percentage of one-half of the population may choose circumstances permitting between these several types as his place of abode

Community Planning and Housing

CLARENCE S. STEIN, *Associate Editor*

Big Cities

This is the age of immense cities. Yet future generations will be stunned and dismayed that these most gigantic productions of our time came into being without plan. And that is not because we are technically unable to plan,—for, in America, architects have excelled in planning convenient and beautiful houses, efficient factories, well and economically arranged schools, libraries, railroad stations. But we have not planned cities. They have grown to fit the whims and conveniences of individual owners of small parcels of the underlying land. It as though, as the result of the separate arrangement of each department of a factory, the parts of the manufactured article were shipped back and forth and up and down, instead of following a systematic course through the building. The factory, in such a case, would be filled with elevators, aisles, and passages, just as our cities are filled with unnecessary traffic thoroughfares and transit lines. If our cities were laid out as well as our factories, workers would walk to their work and the cost of subways would be saved; if our cities were planned as intelligently as a well arranged home, we would have sunlight and spaciousness everywhere. We would eliminate unnecessary streets and railroads. Every building,—every street,—would be located where it would best serve.

Why Cities?

Best serve! What do we mean? What is the function of a city? Is it not to simplify, as far as possible, our all too complicated life? To create a place in which to co-operate toward living happily and fully, in both work and in play? But such a supposition does not describe

our great centers of population. New York City, for example, to most of those who exist within it is the place where one battles with mobs at subway stations; where one hangs crushed from a strap inside crowded cars; where one lives in indecently crowded tenements without air or light or the sight of green; where long lines of trucks stand idle along the wharves while waiting to move our food and the material for our work,—industry blocked by congestion; where even on Fifth Avenue with its traffic police and flashing signals one can walk quicker than one can travel in a cab.

Such is New York. The other great cities differ only in degree.

Symptoms and Palliatives

The symptoms of our disease are so apparent. They are reflected everywhere in congestion. In humans crammed, jammed, crushed, huddled, and finally deadened to the realization that a way of escape must be found, and yet, like prisoners forgotten in a dungeon, groping for some way out. Thus, with pathetic stupidity, we spend millions on palliatives. No sooner is one subway finished than it is more congested than the last. The crowds that struggle to and from the center of action increase faster than do means of transit. Each year the length of a passenger's journey increases as does the cost of that journey. Ultimately the city or the individual must pay that cost, out of production of something or other. Subways do not alleviate the disease of our cities,—they spread it. They are the insidious tentacles that shoot out in the guise of blessings. Toward the life-giving green, they point with their lure of escape, but alas! they merely enlarge the area of chaos. New tenements and slums arise to rival the desperate congeries from which it is hoped that they will lead away. They are the monstrous illusions of the blind game of palliation. They contribute directly to the chief curses of New York City,—congested housing and clogged transit,—yet the Transit Commission now asks for fifty-five million dollars to sink into more subways. The day will come when instead of building these holes in the ground we shall see the wisdom of scrapping many of those now existent,—just as some day we shall scrap all of our slums. But how?

New York has had two competitions during the last few years. They attempted to find a way of replacing the worst and most antiquated housing. The first was the competition of the Reconstruction Commission of the State of New York for the purpose of "remodelling a characteristic old tenement block in the city of New York so as to make it a decent place to live in." The program stated that: "Two methods have been suggested as a practical means of replacing the old tenement districts with decent living places. One is to tear down the present structures and replace them with new buildings. The second is to alter the existing structures in such a way as to make them wholesome, light, airy, sanitary places to live in. With the present costs of building it is impracticable to attempt the first method on a large scale if the same end can be attained by remodeling the old buildings."

But the Jury, after receiving estimates for the reconstruction of the block as contemplated in the winning designs, concluded that such a solution was impracticable and said: "The Jury finds that no one of the competitors has submitted plans that give satisfactory living conditions at costs that would make the alteration of the whole block commercially possible."

But hope never deserts the reformer. So, we have another competition,—this time an attempt to build anew in the crowded parts of the city. But these new houses must pay a return on capital,—a limited return, it is true,—and land is costly in the crowded parts of town near working places. Thus, perforce, all hope of decent living conditions was abandoned by the writer of the program of this last competition: Congest as many rooms on this limited and prescribed space as your ingenuity will allow,—this is the problem,—was what the program said. Is it any wonder that the results were such as are described by Mr. Ackerman elsewhere in this issue of THE JOURNAL? Will we never learn that the trouble is not with the planning of the details of our living or working place but with the conception of the city as a whole?

Yet more transit and "model" housing are not the only palliatives held out to our overgrown cities. There is also the patent medicine of zoning. As a sure cure, zoning is permitted by law under the police power because of its relation to health, safety, moral order and the general welfare of the community. Only, as Mr. Thomas Adams points out in the pages of this issue, it is stupid to urge zoning in advance of a basic plan premised on land control. Yet zoning is "sold," to quote our advertising friends,—not because of its advantages to the community as a whole but because it protects and increases the value of property held by individual owners of those small parts of the city called lots or parcels. Such is not a value expressed in terms of better and healthier men, women, and children, but value expressed in terms of money. Otherwise, zoning would be likely to come up against a stone wall.

Zoning in Philadelphia

Listen to the tale of zoning in Philadelphia, as narrated by Mr. Medary, a member of the Zoning Commission:

"A semi-official Zoning Commission for Philadelphia was appointed by a recent Administration about four years ago. This Commission prepared a Zoning Ordinance with maps of the City, and submitted it to the City Council shortly before the expiration of the Administration then in office. The proposed Ordinance was discussed in Councilmanic Committee but failed to receive favorable action before the adjournment of that Council.

"The following Administration came into office under a new charter, which contained provisions for the appointment of both a Zoning Commission and a City Planning Commission. After some delay the Zoning Commission was appointed, but the City Planning Commission has not yet been appointed.

"The result of the labors of this new Zoning Commission was an Ordinance with maps, submitted to the City Council, toward the end of 1921. The Ordinance was referred to a Committee, which Committee appointed certain days in January of this year for public hearings. At the first hearing a violent opposition to the proposal of zoning Philadelphia developed from several very large interests in the center of the business district. The discussions, which lasted through several hearings, were devoted almost

entirely to the regulations restricting the height of buildings in this district. No serious discussion of either area or use was reached in any of the public hearings. The arguments against zoning were largely appeals to the prejudice of so-called 'practical' minds, such as calling zoning 'socialistic,' 'German,' and 'city beautiful' propaganda. The Commission insisted that zoning was socialistic in so far as it placed the interests of society above the interests of the individual and insisted that the claim of the individual to complete independence regardless of the effect of his actions on society was Anarchy, and that while our political institutions are regulated by some basic plan in the interests of society as a whole, our physical development progresses today without regulation, and at the whim of the individual.

"It was apparent at the first hearing that the Councilmanic Committee had a majority opposed to zoning, and after three hearings it was moved that the entire central section of the City be eliminated from the provisions of any Zoning Ordinance, and the rest of the Ordinance be returned to the Zoning Commission for revision.

"The Commission has had one meeting since the above action was taken, the result of which was to request the City Council to make an appropriation sufficient to carry on public meetings in the different parts of the City, and also to request from the City Solicitor an opinion upon the legality of any Ordinance which excluded any part of the City. The appropriation has been denied, but we shall go on."

Plan for the Comprehensive Development of the Port of New York

The Port of New York Authority is an attempt to solve the difficulties that arise from over-centralization. In this case the cure proposed is neither transit, housing, nor zoning, though all of these are affected by the plans for a thorough reorganization of the transportation of materials in the port district. The comprehensive plan approved by the legislatures of New York and New Jersey is the result of over four years joint study by the New York and New Jersey Port and Harbor Development Commission, and the Port of New York Authority. It is a regional plan for the vast area known as the Port of New York with a population of about 8 millions and a water front of 800 miles. The natural advantages of the site have gained for New York a predominance which has survived its woeful uneconomic operation. In 1914, the latest year not materially affected by the war, 76 million tons of freight moved into New York by rail; 45 million tons by water; 100 million tons of grain are exported annually; add 38 million tons of fuel and 4 million tons of food and the total is sufficiently startling.

But this prodigious unco-ordinated development has cut off the island of Manhattan from the commerce and industry of the other portions of the Port. The Upper Bay, the Hudson and Harlem Rivers flow between. Only to the east are there any bridges. Connection to the west is by three railroad tunnels carrying passengers only. Thus the whole west shore of the Hudson for a hundred and fifty miles to the northward is cut off from Manhattan, but on this western shore terminate the majority of the railroads which serve New York City. Nine of the twelve have their terminals in New Jersey, yet they bring in practically all the products from the south and west, which in turn are distributed on the island of Manhattan,—it matters not whether for consumption or manufacture in the most congested parts of the district. Food and other things received in New Jersey are carried over to Manhattan by lighters or more often on car floats, and then transferred to the pier rail stations which occupy a large part of the lower Hudson and East River shores of the island. The streets outside these piers are so congested with trucks that more time is spent in waiting for freight than in hauling it. Thus it is not strange that the freight cost from Buffalo to the New Jersey shore opposite New York City is less than the cost of moving goods from that point to its Manhattan destination. This incredible congestion is aggravated by the fact that food, destined for the Bronx, Brooklyn, or even Newark must first pass through the primary markets around Washington Street. (Food may pass through Newark to Jersey City or Hoboken, be floated across the Hudson, trucked to the markets, and then take the same identical back track for Newark.) Thus is the Port of New York operated at the present time. The comprehensive plan of the Port Authority attempts to eliminate some of this waste. The problem is one in regional planning. It is proposed by means of tunnels and new connecting railroads to accomplish freight distribution at the minimum of cost. This rationalization of transportation in the Port will lead, it is believed, to a considerable decentralization of industry. Some of Manhattan's superfluous load may be taken elsewhere. But if the project is merely to build fresh centres of congestion in New Jersey and Long Island,—what is the use? If outlying land values are to be increased and capitalized, little will be gained through the development of a large area around New York. It is not a bigger city, but a saner type of city that we need,—a well functioning city,—the first requisite for which is the decentralization of industry. The Port Authority Plan may help to make that possible, but it can only be by imposing a limitation on the size of working and living units, accessible not only to each other but to adequate agricultural and recreational areas.

Does the Architect Fit?

Mr. Raymond Unwin, the eminent English planning authority, speaking recently at the exhibition of American architecture in London, said:

"Modern large towns appear to have outgrown their organization, and we citizens have to make up our minds whether we can wisely or even safely allow them to continue indefinitely to expand without some fundamental change, without introducing a new general form, a fresh arrangement of the parts. Green girdles, detached suburbs, satellite cities, or the founding of colony towns to provide for expanding industry and population are being considered as possible alternatives.

"The economic life of most of our great cities is based on manufacture, and often requires the local concentration of many industries upon a suitable area, where raw materials and finished products can be brought in and despatched with the minimum amount of handling and expense and where power and other facilities can be provided. These areas need to be selected and preserved, and to enable this to be done properly, the conditions regulating their position, their size and their distribution in relation to

the city need to be determined. The great markets are also important to the distribution of the citizens' food.

"We have further to consider the question of the distribution of population. We have to decide how best to guide this distribution to provide the easiest access to commercial centres and industrial areas for those who work there; and further how to combine with this distribution the greatest possible localisation of the lives, activities, and enjoyments of these redistributed populations, a matter which is of the greatest importance in the interests of economy of transport, reduction of congestion in the central areas, and also in the interests of that greater development of local community life on which the maintenance of an adequate standard of character in modern city populations largely depends.

"These are problems in which the architect may take the greatest interest, but we do not pretend that they are architectural problems, and we recognise that their solution must take precedence of that particular aspect of town planning with which we are primarily concerned. When once these general questions of distribution have been determined and the community and their governors have made up their minds what is the nature of the development for which an orderly plan is sought, at this stage it does appear to me that the creation of a design which shall fulfill these requirements, and give definite form to the vague aspirations of the people, which shall satisfy the various needs in their proper order and proportion, neglecting none of the utilities, but so disposing and grouping the various necessary parts in relation to the particular site, its hills or its valleys, that in the natural order there will grow up upon this plan a beautiful city, satellite town, or suburb,—this, I maintain, is an architectural problem, one of the greatest of such problems, calling for the fullest exercise of that particular power of planning in which the architect is trained throughout his life. It is the trained capacity for design which should enable the architect to seize upon a mass of requirements and conditions, and by the exercise of his imagination to select the essentials, to subordinate the details, and to weave them all into an orderly and beautiful whole."

But, as Mr. Thomas Adams so wisely points out in his London Letter to which we have already referred, means must first be sought and found for a plan of land control under which the socially created use values of land shall not be appropriated and capitalized for private profit. Such a plan is basic. On no other structure can any beneficent city plan be erected.

City Air Stations

Plainly pointing to the impending addition of new factors in transit and transport is the report that the Air Ministry of England are proposing the establishment of an air station on the Thames, probably in the neighborhood of Westminster Bridge. Experimental trials of hydroplanes on the Thames and the Seine have demonstrated the practicability of using the rivers both for take-offs and for landings. Three quarters of an hour would thus be saved in the London-Paris air journey, while it is probable that the Thames air station would provide a service to Dublin and Queenstown, thus sparing Atlantic passengers any railway journey over the London-New York route.

London Letter

An Architectural Squabble

Sir Charles T. Ruthen, F. R. I. B. A., occupies the dual position of President of the Society of Architects and Director of Housing of the Ministry of Health. In the former capacity he has just delivered an address to the Society of Architects in which he blamed the architects for the financial failure of the State Housing scheme. It is needless to say that this indictment of the profession has created a wave of indignation among his brother craftsmen. It will be remembered that a real estate member of the staff of the United States Housing Corporation charged certain town planners and architects with the responsibility for the high costs of housing in America during the war on the ground that they gave too much attention to obtaining aesthetic and too little to obtaining practical results. That was perhaps a natural attitude for one to take whose view point had been developed along strictly commercial and unimaginative lines. Sir Charles Ruthen however is himself an architect and has indicted his own profession.

There is a curious parallel between the charges made against the town planners and architects of the Housing Corporation and those now made against the English architects who have been engaged in designing houses under the Government Housing scheme in England. The statement of Sir Charles according to authentic report is that the architects were obsessed by art and overlooked financial considerations. They allowed their pencil to "run wild in the dream of the artistic home."

He went so far as to condemn architects as profiteers in their art and as the leaders of the other profiteers. The result he said was that they contributed to a capital loss of two hundred million pounds.

There may be a germ of truth in these charges and some architects may have failed to submerge the claims of their art in favour of the claims of economy at a time of peculiar national stress. Even so their faults leaned to virtue's side, and they have a right to repudiate any responsibility for seeking after cheapness for the sake of cheapness.

The Ministry of Health had a staff of architects engaged to overlook housing schemes and an expensive regional organization scattered over the country supervising the local schemes of all architects employed by the municipalities. If there was any fault in the matter of neglect of supervision of costs or indifference to profiteering of builders it must be charged against these officials of whom Sir Charles Ruthen is now a colleague.

Architects have done much to raise the standards of municipal housing and their remuneration has been fixed on the usual percentage basis. Many of them are suffering serious loss as a result of having prepared plans for extensive housing schemes which the Ministry of Health has ordered to be abandoned. A predecessor in the Chair of the Society of Architects, Mr. E. J. Sadgrove, describes Sir Charles' criticism as nothing more than a political stunt and accuses the Ministry of Health as the responsible body for indulging first in a policy of squandermania and of now trying to get out from under by getting back to brick box styles of dwellings and whittling down architects' fees to less than what is paid to the road sweeper.

It is an unfortunate quarrel and shows that there are cases in which the official architect may suffer in his outlook by association with politicians. There is a tendency among many government officials at the present time to play to the gallery, which is always ready to applaud any sentiment in favour of cheapness. It is a natural reaction against excessive prices and profiteering. Professional men, no matter how free of blame, have to suffer in common with those who are responsible. Part of the personnel of the bureaucratic machine created by the war is fighting for its life and part of its method is to condemn others for its own sins, and to discredit what were its own ideals because of its failure to adapt them to practical needs.

EDITOR'S NOTE: Sir Charles Ruthen has resigned as President of the Society of Architects, following the action of the Council of that body in expressing its dissenting opinion, and the R. I. B. A. has, through its Council, challenged Sir Charles Ruthen to prove his statements.

Heights of Buildings in London

Since 1894 the London County Council has had power to prevent buildings from being erected in London of a greater height than 80 ft. Prior to 1894 it was 90 ft. They have discretionary power to permit buildings of a greater height but the 80 ft. is the standard they follow. Above the 80 ft. two stories may be added in the roof and thus the height of buildings in London is practically limited to 100 ft. There is a further provision in the by-laws preventing the erection of buildings on streets less than 50 ft. to a greater height than the width of the street, and another limiting the space on any one compartment of a building to 250,000 cubic feet.

The last provision affects large department stores but only to the extent of requiring the interior of the building to be sub-divided into compartments of not more than 250,000 cubic feet.

There is a movement among a group of architects in the R. I. B. A. to get permission to erect higher buildings. Those who are engaged in the agitation repudiate any suggestion that they favour skyscrapers. They want the present height limit of 80 ft. raised by 20 or 30 ft. For the present the Institute as a body has opposed the proposal, but the question has not been finally settled by the members. The Town Planning Institute is giving the matter consideration and their probable attitude will be that no greater heights should be permitted till a proper plan of London has been prepared so as to have the question of heights settled in proper relation to width of streets, bulk of buildings on lots, and traffic problems. London is not as well provided as New York with wide streets. Its traffic ways are narrow and tortuous and many of the sidewalks in its business thoroughfares are totally inadequate to accommodate pedestrian traffic even in the slack hours of the day. With the present heights of buildings traffic congestion of all kinds is creating serious problems. The L. C. C. has decided as a result of the agitation to send its chief architect to New York to make a study of high buildings.

Zoning

Little has been done in England in zoning on the lines so fashionable in American cities. In some town planning schemes, notably the Ruislip and some Birmingham schemes, limits have been imposed in respect of height, use and occupancy (or density). As applied to buildings to be erected in the future so far as existing built upon areas are concerned, no zoning has been done, and the present legislation is not favourable to its being done. For instance, little encouragement is given under the law to the inclusion of fully developed land in the areas of town planning schemes, and, unless such land is included no effective regulation is practicable. The revised town planning act of 1919 makes the inclusion of buildings in town planning areas easier but the procedure to be gone through in serving notices on each separate owner and leaseholder makes the task of delimiting the height and character of buildings already erected very cumbersome and expensive. As a result of the American example much interest is being taken in the question of zoning, but it will be a misfortune if zoning schemes are introduced as a substitute for comprehensive town planning schemes in which adequate provision is made for the control of land development.

Meanwhile there is a good deal of activity in promoting town planning schemes. Local authorities are anticipating the coming into force of the compulsory clauses of the act of 1919. Under that act all urban districts having a population of over 20,000 must prepare schemes within 3 years after January 1923. Over 300 authorities will be affected and, if the scheme is not vetoed because of the cry of "economy first," Britain will shortly enter upon an active period of town planning.

The creation of the Irish Free State and the setting up of a Government for Ulster is causing attention to be given in Ireland to the desirability of town planning. We may witness great activity in that country to revive the prosperity of cities and towns that have been suffering from decay for generations in spite of great natural advantages. Ireland may go far in the direction of social reconstruction under the new regime.

Housing

The Ministry of Health is steadily cutting down the housing programme. One municipality that intended to build 400 houses has built 50 and is not permitted to proceed further although it has brought the land and constructed the roads and sewers for the purpose.

Meanwhile unemployment continues to be serious and the housing shortage is as acute as ever. Prices of materials are beginning to drop but owing to the fictitious schemes given to them under government control of production they are still too high to command a ready market. The consequence is that there are heavy accumulations of stock. More than 30,000,000 bricks are stacked in yards of Peterborough brickmakers.

With falling prices there is sure to be a revival of building in the near future. One local authority has had new estimates for the erection of 5 roomed houses and these represent a saving of $1,500 per house as compared with a year ago. A high authority expresses the view that the cost of houses in another year will not be greater than 50% above pre-war costs.

All the ideals regarding reconstruction, all the hopes regarding getting an ample supply of homes "fit for heroes

to live in," and maintaining high wages have vanished. We have passed in England from the stage of expectancy of a better world for the wage-earner as a result of the war. Unemployment and ruinous taxation are creating a bitterness of spirit and a philosophic acceptance of pre-war standards, as the only attainable ideal.

One hears some echo of Emerson's declaration that the less government we have the better—the less confided power. It will be a misfortune for England if this state of feeling is used to push forward a gospel of economy at all costs. What is really wanted, as Frederick Harrison says in *The Times*, is a new religion of human duty to supersede the passions, jealousies, and obscurantism that made the war and still survives it. "Until," says Harrison, "our people—all peoples—can be trained to feel in their souls a religion of social duty, there is no hope of much good coming from makeshifts of practical policy."

London, February, 1922. THOMAS ADAMS.

Around the Secretary's Table

BY THE SECRETARY

THE SECRETARY: I am struck frequently with the extent to which it appears necessary for the Architect to have a legal turn of mind, if indeed not also a large amount of knowledge of the law and its cases. I am frequently in receipt of requests from lawyers and architects for information as to cases bearing on some particular point. It is of course necessary to reiterate that the Institute can not attempt to keep a complete file of cases arising out of building contracts. There are regular channels by which lawyers reach such information and it seems wiser to leave this responsibility with them. Anything short of an absolutely complete file would be a waste of time and money, and a complete file would certainly involve considerable expense. Recently, I was asked to say whether drawings and specifications, as instruments of service, were the property of the Architect. Now, of course, we have not any legal data in the form of a file of cases bearing on this matter, but merely such information as is readily at hand in books like Blake's "Law of Architecture and Building" and T. M. Clark's earlier work entitled, "Architect, Owner and Builder before the Law."

Blake states on page 90—"as a matter of fact, however, unless there be a specific provision in the contract whereby it is agreed that the plans are to be and remain the property of the Architect, they must be legally considered, it seems, as the property of the Employer who has ordered, accepted, and paid for them." He goes on to cite cases bearing out this assertion. He refers to Article 7 of the present A. I. A. Standard Documents, which provides that "the drawings *are* the property of the Architect, as indicative of a realization of the necessity of a definite agreement in regard to the plans, if the rights of the Architect therein are to be properly protected."

MR. KENDALL: I believe the English law has conceded ownership of plans to the Architect. An exception to this was the case of Barry *vs.* Houses of Parliament. My impression is that the courts in this country have almost always decided for the owner.

THE SECRETARY: Mr. Clark, in his book just mentioned, refers to the Schedule of Charges of the Institute which contained the clause, as it still does, that "drawings, as instruments of service, are the property of the Architect," and adds that "although this clause expresses what Architects, without exception, believe to be the natural and proper arrangements, it finds little sanction in courts."

Blake's later work seems to conclude differently when the provision is definitely made in the contract. He states, however that it is hardly sufficient that this provision should be only in the contract between the Owner and Contractor as the Architect is not a party to it. He says on page 92, ". . . it is advisable that a memorandum of agreement in this connection be entered into direct between the Architect and the Owner. Under such circumstances no such technicality could be urged to defeat the interest of the parties as outlined in the agreement between them."

He certainly conveys the impression that if such an agreement is a matter of record it will hold in court.

MR. MUELLER: In Article 2 of the General Conditions of the Contract, A. I. A. Standard Documents, the last sentence states, "even though the signature of the Owner and the Contractor may have been attested by witnesses they may be proved by any competent evidence." I can not satisfactorily interpret this sentence. Is it possible that the word "not" has been omitted between the words "may" and "have"?

THE SECRETARY: No. The phraseology is intended to be as printed. The idea is that generally when a signature is attested by witnesses it is legally necessary to secure these witnesses in order to prove the signature, and this is frequently difficult. The clause was devised as written so as to permit in such cases any competent evidence in proof of the signature. When the third edition of the Standard Documents was developed the words "In presence of" and the lines for the signatures of witnesses, which had always theretofore appeared at the end of the Form of Agreement, were omitted, our legal advisers stating that the witnessing of signatures was much less frequently done in recent years and quite unnecessary.

MR. MUELLER: One other point. Article 21 provides that the Owner shall maintain fire insurance upon the entire structure. In a recent general condition on some State of Ohio work, the following clause was used instead. "Fire insurance will not be maintained by the Owner, but the Contractor may carry such fire insurance as he may desire to protect his own work or property." I would like to have your opinion on this latter clause, whether the Institute deems it sufficient for every day purposes or whether this clause may have been used with particular reference to Government work only.

THE SECRETARY: Of course a State or Municipality may have an established policy by which it never takes out any fire insurance on its property. In such a case it, of course, assumes responsibility in case of loss and the permissive clause quoted would conform to its policy. For ordinary private work, however, I believe such a clause is highly undesirable in every way. The Owner is primarily interested in the matter as his interest always far exceeds the interest of the Contractor, whose interest is only for such portion of the work as may be in excess of the amount already paid him by the Owner, and for his equipment. As the work nears completion the Owner has almost full value involved and it is to his interest that it be protected by full insurance.

It is for this reason that the Standard Documents provide that the Owner shall take out insurance to protect everybody's interest. This covers all interests adequately by a single policy, the responsibility for maintaining which being placed upon the man who has the greatest interest involved.

THE SECRETARY: The rapid rise of building costs in 1920 has been a source of a good deal of trouble to Architects as well as Owners. Many a building has been projected and when the Owner's requirements, or perhaps his desires, have been developed into plans, and estimates secured, the cost has been so much in excess of the Owner's purse that the work has of necessity been abandoned. A rather typical case was presented to me by an Owner late in 1920. He was acting with the consent of his Architect, who was a friend, and they joined in asking my opinion on he facts in the case. They stated the case briefly as follows:

"The Client suggests to the Architects that he would like to have a house that could be built inside of $20,000.00, covering certain stated requirements. The Architects submit rough general ideas, they are discussed, and finally a complete set of plans and specifications are made by the Architect. Upon submission of the plans and specifications to builders for estimates, the lowest figure received proves to be $60,000. The Client declines to proceed further in the matter and the Architect claims that he is entitled to his fees, provided by the practices of the American Institute of Architects, of 6% on the estimated costs.

"Question: Is the Client liable to any extent, to the Architect, and if so, to what extent?"

Such an inquiry is somewhat embarrassing. The Secretary of the Institute is not only not omniscient, but is given the very barest outline of the facts. All those essential details of conferences and statements by both Owner and Architect, that are of prime importance in making a fair decision, are lacking, and yet the Institute should try to be of some service when such appeals are made. In the hope of doing so and yet refraining from any appearance of making a decision on the insufficient evidence submitted, I wrote the following letter, which I quote *in extenso* in the thought that if it puts the case fairly, it may serve to suggest procedure to others in similar trying circumstances, and if it does not seem to some an appropriate reply the Secretary will hope to receive their comments for his assistance in the future.

"It is very unsafe, and unwise therefore, to presume to give a verdict on a definite case with such incomplete information as must necessarily be involved in a brief correspondence. Personal interviews and careful study of all the facts, which involve in every case the conversations that have occurred at various interviews between Client and Architect, as well as documentary evidence, can alone fit one to pass definite judgment.

It seems evident to me that you and your Architect are mutually desirous of determining the right and customary action under the circumstances and I am glad to suggest some lines of thought involving questions to which you both can undoubtedly give the correct answers, after which the just settlement of your obligations will, I believe and hope, be readily determined.

(1) An owner arranges with his professional adviser to perform certain service, originally contemplated to be complete. Clearly then he owes him remuneration according to common practice for such portion of that service as he performs in good faith and with that degree of skill reasonably to be expected of such a professional man.

(2) Paragraph 1 of the A. I. A. Schedule of Proper Minimum Charges, Document 124, establishes 6% as a reasonable standard minimum charge for full professional services, except for such cases as are outlined in paragraph 2 as justifying a higher charge.

(3) At a certain stage the Owner decides, as he always has a right to do, to abandon the undertaking.

(4) Paragraph 8 of the above document establishes the Architect's right to recover for such partial service and paragraph 9 determines a basis for arriving at the approximate remuneration under certain fixed conditions of abandonment. Upon completion of 'specifications and general working drawings' (exclusive of details) 60% of the appropriate total fee being computed on a reasonable estimated cost of the work as drawn, or upon the lowest bona fide bid.

(5) If the drawings as estimated have not been approved by the Owner as representing what he desires, or if he has given the Architect a definite limit of cost as a fixed condition and the bids are widely at variance therewith, it will be necessary to make some adjustment, according to the specific facts of the case. Under present day conditions bids of different contractors are widely different themselves, and a more generous leeway must be allowed for the Architect's judgment of estimated costs. Just what is reasonable must be determined to fit the special conditions of each case.

Sometimes an Owner gives a limit of cost that is inconsistent with the demands for accommodations in the structure, which he also lays down. The Architect may or may not make clear or attempt to make clear to him this inconsistency, which, if marked, should be noted by him and reported to the client. This element involves frequently many complications in settlement for abandoned work, and the fullest scrutiny of the acts and implications of both Architect and Owner is needed to arrive at a just decision.

I suggest that you analyze your problem along the general lines indicated and if you do not find readily a mutually satisfactory answer and desire further general information on phases of your problem, I will be glad to have you write me further.

I am glad to be of any assistance I can so long as I am not placed in the position of assuming to decide at long distance a specific problem that is always complicated and needs the closest inquiry."

The following month a similar case was reported by an Architect substantially as follows:

In the spring of 1918 plans for a building were begun and the building was almost completed in the fall of 1920. The Owner told his Architect to design a building to cost $50,000. So much was desired in this building that the estimate was $60,000. They delayed starting then for some time, but finally started it in the spring of 1920 (just when prices started on their spectacular hill climbing contest, it may be noted) and spent about $95,000.

The Building Committee refused to pay the Architect his commission on a basis of 6% of $95,000 and demanded that he send them a bill in full for 6% of $50,000, which was the amount they had said they wished to put into the building.

He asked for advice.

Here the facts seemed to indicate a perfectly normal course, in view of the trend of building costs during the period involved. Was I justified in writing him as follows?

"I beg to acknowledge your letter of the 16th. The present high cost of building has brought several problems like yours to my attention quite recently, one being a case where the Owner has been shocked at the final cost of the work, and has endeavored to relieve himself of the necessity of paying the Architect percentage on the full amount. In one case, as the facts were presented to me briefly in correspondence, the excess was so great that it seemed to me to indicate laxity on the part of the Architect in handling the situation. The general results stated in your letter indicate a perfectly normal condition, and appear entirely reasonable under the most skillful handling of the situation by the Architect.

Conditions would seem to indicate a rise of at least fifty per cent in the cost of building since early in 1918. The problem is one of the problems connected with the percentage method of charging, and the reasonableness of charging full percentage on the higher cost comes back to the general increase in the cost of living, for which the Architect must find compensation in his fees. On this basis the application of a fixed percentage to the increased cost operated automatically to meet his own increased cost of living. Whether or not the Architect can insist upon full percentage for actual cost in any given case depends on all the facts in the case regarding his service, and the acts of himself and the owner throughout the progress of the undertaking. Assuming that he has rendered full and conscientious service, and that increased costs are due to causes beyond his control, even they may be also beyond the control of the Owner, then I believe that the Institute's schedule of charges indicates clearly that he is entitled to percentage on the total final cost of the work.

You indicate that the Owner delayed starting construction but finally started it last spring, and has spent about $95,000, which indicates it was done on some sort of cost basis. Such a basis of contract generally involves the Architect in extra service which justifies a charge above the normal percentage, unless the method of procedure is specially designed to relieve him of this extra burden.

As always in such cases it is impossible for me to judge with any accurate application to the particular case in point, the full details of which it is impossible for me to know. I can only indicate what I believe the Institute documents will support under certain assumptions, and must necessarily leave wide scope to the persons involved for the application of my suggestions to their specific problem based upon actual, full knowledge of all the conditions."

Certainly the whole question of charges is a most interesting and complex one and worthy of very careful study and the Secretary will welcome any comment that will help to develop sound practice.

Building Obsolescence

Deductions for obsolescence now permitted under the Income Tax Law have raised questions too long ignored by architects and investors in buildings. We hope to have an important contribution to make on this subject in our next issue, for building depreciation has both a social and a financial aspect.

Competitive Bidding on Cost-Plus Contracts

Anyone familiar with the details of the Building Trade feels enthusiasm for any proposal that emphasizes the possibility of appraising the value of builders' services. The same enthusiasm holds for any proposal to open the detail estimate to the examination of the designer of any architectural or engineering work. The resultant economies of such procedure are too obvious to need discussion.

Mr. Lord, in his article in the February JOURNAL, has done a good service in suggesting even the possibility of these things. I believe the principles that Mr. Lord has laid down are valuable. I am not satisfied that any equation is workable in selecting a bidder. The principal difficulty, it seems to me, will arise not when the estimates are identical, but when the estimates vary, as they commonly do.

However much theoretical emphasis is placed upon other factors, price is likely to become prominent, and I fear that the engineer or architect who has received varying estimates will have a recurrence of present day difficulties if he tries to persuade the owner to accept a middle rather than a low figure as correct. It also seems probable that the various items of the bids are likely to be compared, and that there will be an attempt to combine the low items of all the bids in the lowest one. The constantly recurring and ever human belief that the low bidder is right, it seems to me, will upset any theoretical equating of values which may be accepted academically.

After all, the value of Mr. Lord's scheme to the Building Trade as a whole lies in the proposal that the designer should be supplied with two things,—a method of determining the value of building organizations and that he should be equipped with a detail estimate of his design. In the past few years a number of the leading architectural offices have recognized the necessity of detail estimates of their design. Both for the sake of their own economy and for the saving of time and expense for their client it has appeared desirable that these estimates should be made as the designs progressed rather than after the designs have been completed. Some few builders have recognized the tremendous economy offered by a combination of the estimator and designer and have organized themselves in such a way as to be able to place skilled estimators in the designing room of the architects. Accordingly as the various features of the design develop and as alternate materials are considered for the different elements of the work the price of the alternates has been laid before the designer, who thus has been able to balance price against quality and to assure himself that the cost of his design will not exceed the client's appropriation.

Genuinely skilled estimating service of this sort is very rare, but where it has been conscientiously applied the results have been most satisfactory, both to the client and to the architect. Some few building concerns who have been farsighted enough to see the coming demand for this sort of service have already succeeded in creating a very large and profitable business. One large concern now under the management of the third generation has so far succeeded in this way that it has had its choice of business and even during the depression was handling many millions of dollars worth of the highest grade construction.

This firm is selected not by any competitive method, but because of the proved ability to add its experience to that of the architect on any problem this firm agrees to touch. Long experience has demonstrated that the buildings handled by this firm are better built, sooner finished, and offer better investment value than buildings handled in other ways.

It seems to me that buyers of buildings naturally divide themselves into the classes of those who consider that the builder is bidding on a commodity, and those who recognize the fact that the bidder is actually offering a bid for service rather than a bid for a commodity. Once it is understood that the builder is largely a broker it seems entirely possible that he should be engaged to work with the architect in developing a design, the price of which design he may very well in the end guarantee.

I am far more impressed with the idea of selecting the builder before the design is developed than I am with selecting him after the design is complete. It is probably a fact that intelligent cooperation,—I wish again to say that this is very rare,—will result in far greater savings in total cost than can be obtained by close competition in total price.

It seems reasonable to hope that the next few years will develop a demand for a high standard of service from honest, capable builders and at the same time create a fuller appreciation by the architects of the strength that a combination with such builders can add to them. When success follows the men possessing the imagination and power to cooperate under new arrangements then their methods will be studied and followed. The chance of improvement is in the hands of the few who grasp possibilities and intelligently apply them.

MORTON C. TUTTLE.

Boston, March, 1922.

Committee on Small Houses

EDWIN H. BROWN, *Chairman*

Since the announcement of the work of the Small House Service Bureau in the January JOURNAL it may be of interest to know that the following additional newspapers have taken over the mat service:

Cincinnati (Ohio) *Times-Star.*
Poughkeepsie (New York) *Sunday Courier.*
Winona (Minnesota) *Morning Leader.*
Chicago (Illinois) *Daily News.*
Lancaster (Pennsylvania) *Intelligencer and News Journal.*
Rockford (Illinois) *Register-Gazette.*

The Bureau is endeavoring to standardize the heading used with the mat service as follows: "HOME BUILDERS' CLINIC."

The Minneapolis *Journal* has has become so interested in the possibilities of this service that it has decided to become a model client of the Bureau. It is going to prove to small home builders that, with limited sums of money, small attractive homes can be built for reasonable cost. The *Journal* has bought a lot and is going to build, on the lot, under the supervision of the Northwestern Division of the Architects' Small House Service Bureau, House No. 654. The operation will be carried on in exactly the way an owner would have to proceed. It is hoped that other papers throughout the country will see the possibilities of such a service to their community and do likewise.

The Northwestern Division has prepared a travelling exhibition which is being routed to a number of the Chapters of the Institute which are co-operating with home building expositions. Included in this exhibit are advance sheets from the book being prepared by the Mountain Division of the Bureau, headquarters at Denver, Colorado. Many inquiries are coming in to the office of the Northwestern Division for exhibit material. Colored photostatic enlargements of pages of the book, "How to Plan, Finance and Build Your Home," have been made and, with photographic illustrations of houses actually built, will form the background of the exhibits.

The United States Bureau, the National controlling body of the Bureau, is issuing a monthly Bulletin, devoted to the work of the Bureau. The first copy of this will be out by the time these notes appear. The first issue will have a circulation of 5000 copies and the subscription price is $1.50 a year. The Bulletin will illustrate the work of the different Bureaus, show houses erected from Bureau plans, state costs, and generally give the small home builder accurate and valuable information.

The Mountain Division of the Small House Bureau has issued advance sheets on about 30 different houses which will be a part of its finished book. The balance of the plans for the book are about finished and the book itself will be out shortly. A number of houses from their plans are now under construction and the promise for a successful season seems very bright. The office of the Mountain Division is at 318–319 Chamber of Commerce Building, Denver, Colorado. Mr. William E. Fisher, A. I. A., is president, and Mr. Donald O. Wiese is Director of Service. The advance pages received promise a very interesting and delightful book.

From Our Book Shelf

Rents, Rights, and Realties[1]

A useful compilation of the recent so-called "Emergency Housing or Rent Laws" of the State of New York. Contains the text of the laws, a general history and survey of the housing problem, a history of the "Anti-rent Wars" in the State of New York, and apparently all decisions, both reported and unreported, which have been rendered, construing the recent rent laws. So far as the writer knows, it is the only book of its kind in the field and it is encouraging that it contains an unequivocal recognition by a judge administering the rent laws, of the absolute failure to reach the root of the evil at which the laws were aimed, and also because it recognizes the unsatisfactory method of dealing even with the question of the adjustment of rents. In this connection Judge Lauer says, "It would

[1] THE TENANT AND HIS LANDLORD.—A treatise on the rights and liabilities of landlords and tenants under recent "Emergency Housing Laws" of the State of New York, with the latest decisions thereunder, together with some historical facts of interest, copies of the laws, and local New York City ordinances and forms, by Hon. Edgar J. Lauer, Justice of the Municipal Court of the City of New York, and Victor House, of the New York Bar, Assistant United States Attorney for the Southern District of New York, published by Baker, Voorhis & Company, 45 John Street, New York City.

seem as though with a little additional consideration and thought by the Legislature, some more satisfactory method might have been devised for the adjustment of differences between tenants and their landlords" (page XIII).

The historical matter is interesting but not comprehensive. It seems to be confined to conditions in Japan, Rome and under the Hebraic law. Of course, it is sufficient for all practical purposes, but does not cover the field sufficiently for a person investigating the field scientifically. A much more comprehensive treatment is found in the briefs in support of the law submitted in the Rent Cases in the Court of Appeals and the United States Supreme Court. Judge Lauer states that, "Housing is, therefore, a necessity of life" (page I) and that, "Only the 'speculative builder' has hitherto shouldered the burden of the large proportion of housing projects." Here we have a statement in unequivocal language by one who certainly is in a position to know, that a large proportion of housing, a necessity of life, has been "shouldered" by speculators. It certainly presents forcibly the question as to whether or not speculation in a necessity of life should be permitted, and it seems that if speculation in the necessity of life has been a failure, it should certainly not be permitted. A study of the reports of the various Commissions of the State of New York appointed to study what has heretofore been called the tenement house problem, would convince almost any person that the attempt by the Legislature to regulate the private control of building has been a failure, and that it is time to discontinue the "widespread call to the government for relief and a general resort to legislation for palliatives" (page VII).

The statement by Judge Lauer that the conclusion is everywhere arrived at that private initiative has proved inadequate to deal with the problem and that systematic government regulation, encouragement and financial aid must be given (page VII) should have considerable weight, as should also the statement that, "In a general way, it may be said that these 'Housing Laws,' enacted under the circumstances described in the last chapter, concern themselves primarily with the needs of the moment. Rents were being raised; tenants were being evicted. This had to be stopped. Only secondarily did the Legislature address itself to the fundamental need: a plan that would encourage house construction. So secondary in importance has this phase of the emergency legislation been quite generally regarded, that many real estate men are still of the opinion that the net effect of these laws will be practically to halt residential building" (page 33).

The conclusion apparent would seem to be that there is still need for a real, thoroughgoing housing reform—for a plan that will reach the root of the evil and thus obviate any further necessity for palliatives such as our present rent legislation.

CLARENCE M. LEWIS.

The Volute

"The Volute in Architecture and Architectural Decoration"[1] by Professor Rexford Newcomb, is the first of an architectural series of bulletins published by the Engineering Experiment Station of the University of Illinois. "It is the purpose of the Station," we read, "to conduct investigations and make studies of importance to the engineering, manufacturing, railway, mining and other industrial interests of the State." The publication of a study of this nature without special comment may therefore cause some surprise to those who are accustomed to thinking that the engineering profession has little sympathy for the ideals of architecture, or that the genesis of the volute should be regarded by it as of value to the State's industrial interests. However that may be, the fact is a significant indication of the breadth of view of those who are concerned with directing the activities of the Research Corps in that University, and a promise fraught with hope that other studies of like nature may be forthcoming.

With the painstaking industry of the serious investigator, Professor Newcomb has collected evidence from every available source bearing on the origin and use of the volute, and has produced a study by far the most exhaustive yet attempted. It is doubtful whether future discoveries or conclusions will add much evidence of value to that here presented.

As to the origin of the volute, the author is of the opinion that it would seem reasonable "to conclude that this curve entered art like most other forms from nature-inspired beginnings" rather than "in connection with the manipulation of materials;" a point of view in which we should prefer to concur, even though the evidence were on the other side, which is not the case. Passing over a discussion of the occurrence of the volute as a feature of the capitals of columns in the different epochs of design, we find our interest centering on the division of the subject treating of the "Early Use of the Volute in Architecture." It is here—especially where conjecture touches on the settlement of the question of the origin of the Ionic capital—that theorizing becomes most interesting and conclusions most important. Rejecting the theory that decoration preceded structure, the author concludes after weighing all the available evidence that "it appears probable that there was little or no Assyrian influence in the development of the Ionic order, but that the spiral motif as found in Ionic art is a product of Aegean culture, and did not come from the East." Bearing in mind the general laws of architectural development he seeks to establish for the Ionic capital an origin in primitive wooden architecture. While there can be no doubt that the membering of entablatures goes back to a wooden origin, one would be inclined to question this theory for the volute form of the capital. The conjectural genesis of the Ionic capital from log ends placed side by side, although ingeniously conceived, does not seem altogether plausible. We should be inclined to limit the analogy here given to the wooden bolster-cap-transformed-into-stone theory of Hitorff and Violllet-le-Duc. Becoming a stone bolster-cap, the rounded-off ends characteristic of the Ionic form follow at once, since otherwise the slightest unequal settlement would cause the stone to crack at its upper, outer edges. Decoration with spiral ornament, first painted, then scratched-in, then sculptured, also follows logically enough for this form as for any other to which it is adapted.

Illustrated with some fifty-five beautifully reproduced figures and supplemented with a complete bibliography, Professor Newcomb's study takes its place as a valuable historical document. Studies of the origins and develop-

[1] "The Volute in Architecture and Architectural Decoration," by Rexford Newcomb, Bulletin No. 121, Engineering Experiment Station, University of Illinois, Urbana, 1921.

ment of the forms of architecture, when presented as here, are of great interest and undoubted value, and while one is tempted to reflect that the conclusions of the investigator would probably in many cases be very different from what they are if he could see all that has disappeared, one would not therefore seek to minimize the importance of the fruits of scholarly research. N. C. C.

Mr. Flagg's Small Houses

We may not care for Mr. Flagg's little houses, charming as some of them are; we may not agree with him about all the virtues of the module system in designing and planning; we may not care for all his economies in construction, although their reasonableness and practicality are demonstrated in houses already built on Mr. Flagg's Staten Island estate, but we cannot help considering with admiration, his attitude towards the small-house problem, his earnestness and enthusiasm, his efforts to eliminate all that is sham, wasteful, meaningless and ugly. I opened Mr. Flagg's book[1] with considerable skepticism; I closed it with profound respect. A visit to his estate, showed that he practised what he preached, and in the few experimental houses already built, that he had succeeded in constructing small houses of durable materials, devoid of sham and make-believe, honest in construction and unique in arrangement, for comparatively much less than houses of inferior quality. The following quotations give a fair brief of Mr. Flagg's house-building creed as expressed in his book and confirmed by the actual buildings:

"Man is for the most part a creature of habit who follows custom without question. When he does make inquiry he sees many of the commonest things of daily life done in ways which are not the best, it is not surprising, therefore, to find methods used in design and construction which can be improved upon."

"One excellent way to save money in building is to tell the truth: that is, to let things show for what they are, and save the cost of making them appear to be what they are not."

"One of the best ways to economize in building is to economize on ugliness."

"The older one grows, and the more he learns, the greater the value he places on simplicity in all things."

A few basic principles underlie Mr. Flagg's small house designs. He himself places the module system first. In this, every dimension is a multiple or simple fraction of an established convenient dimension. This of course tends towards a simplification, harmony and standardization of parts. It has many virtues and many faults, especially in a world full of mechanics who persist in measuring in feet and inches.

Of greater importance, it seems to me, is the utilization of roof spaces and the elimination of cellars. These houses are built with stone walls, ingeniously laid up against a form, mosaic fashion, and backed with concrete. The side walls and eaves are kept quite low so as to offer stable resistance to the thrust of the rafters, which are without ties or collar beams. "Ridge dormers," unique ventilators, are provided, and roof spaces usually hot, gloomy, dirty and wasted are turned into picturesque, light, airy rooms. Storage rooms in lieu of cellars are built above ground as "dependencies," giving the houses more importance and character, but requiring rather extended ground area for the size of the house. The houses certainly utilize the maximum cubage for living purposes, and all the space utilized is highly desirable.

Other features are the elimination of all casings and trim. Practically all the woodwork is solid and structural; the ceilings are the underside of the underfloors above on exposed beams, a little heavier than usual and farther apart; partitions are of solid plaster, quite simple construction, thin, inexpensive and remarkably strong; the roofing is cheap composition material, effectively laid; the windows are simple weatherproof casements; the hardware is much simplified and unbelievably inexpensive. Many of the devices are of Continental origin adapted to American use.

Fortunately Mr. Flagg owned an estate, a stone quarry, and had himself for a client, and every move he made and every experiment he tried as architect under these favorable circumstances, shows serious thought. For this reason alone, be the results what they may, the effort is a valuable contribution to the profession. I have always believed that the influence of art should begin with the every-day teacup and kitchen utensil; thus these houses, the book about them, and the principles of the man who designed them, were revelations.

Typographically, "Small Houses" is admirable. There are fifty-one essays and as many plates admirably drawn by the author and his daughter, with numerous other illustrations. The essays and the descriptive matter pertaining to the plates are unfortunately too often intimately connected when they would much better be independent. This intimacy and the tone of the descriptive matter in many places give the book an undeserved mask of promotion or plan sales propaganda. This is unfortunate. I believe anyone may learn something and gain some inspiration from its pages. The spirit behind it is certainly commendable.

BEN J. LUBSCHEZ.

[1]Small Houses, Their Economic Design and Construction. By Ernest Flagg. Charles Scribner's Sons, New York.

Politics and Poetry

On the "thorny island," as it was then known,—with Londinium hard by to the south-west,—where travelers took their way by ford to Kent, men built a church, some eighteen centuries ago. Roman it was, or so the later found walls seem to say, as the tale of the successive fabrics comes slowly to light. Now, where once lay a rough, wild, marshy strip of land,—islanded by the Thames and nameless waters flowing sluggishly,—rise the tall towers of Church and State,—of Lords and Commons and Westminster. They are not without significance in their impressive juxtaposition, even as Politics and Poetry bear their lesson to the school-children, who coming into the Abbey on their solemn adventure, must pass by Chatham, Beaconsfield, Gladstone, ere they come silently to the Poets' Corner. Of that, we say no more than this, that it has significance, both in its relation to the tombs of statesmen, and because it is in the Abbey at all; and it is hard to say which is the greater significance.

Mary Spurgeon's tale of Westminster Abbey[1] is a sheaf

[1]Westminster Abbey. By Mary Spurgeon. Frederick A. Stokes Co., New York.

of the kind it is pleasant both to garner and to keep. It is of kings and things, of royalty and reverence,—of money basely wrung from high and low that temporal thrones might make their architectural peace with God,—of Craftsmen toiling well and truly and with that skill born only of men free at their labor. A running tale of history it is, of history scrivened and carved, painted and beaten, hewn and blown, and weaving always the legend of a world that made history alive with the color of Gold, with the shadow of short shrift to the weak and much power to the strong,—not such a far cry, it seems, to the tale of our own time. Only the color is gone.

Once again, architecture seems to come alive under the affectionate hand of one who plainly loves and understands it. Not pedantically alive, or dogmatically alive, but alive as something which had a purpose so far above our present helplessness in the hands of Profit and Dividend, that we turn back to it, even though we know all its weaknesses and its slaveries, with something like a sigh. Unfortunately the book is illustrated, of which the less said the better, but one need not look at the pictures. The tale itself is enough. C. H. W.

News Notes

Central heating and hot water supply for small houses and apartments has long been a dream of housing reformers. It seems principally to have failed of materialization because of the narrow economic view which can not yet envisage the vast savings to be effected. A great part of these savings would appear in indirect benefits, such as the saving in coal transportation and ash collection. Individual distribution and collection now costs an enormous sum, but how to translate the saving that would be effected by centralization into a benefit that would be apparent to the householder is a problem that has baffled all effort. The economic system under which we struggle has surely the very grave defect of preventing any equitable distribution of the savings possible through centralization. These gains are discreetly absorbed by some occult process with which we have not yet become familiar. But the city of Glasgow (Scotland), is considering the installation of a central hot water supply in its municipal housing. It has been carefully computed that 1,200 houses can be supplied with 25 gallons of hot water (150°), all the year round, at a cost of less than sixty cents a week.

Archives are not regarded as precious, in Washington. Congress has again declined to sanction the appropriation of half a million dollars for a site and the beginning of work on the long needed Archives Building. This time the blame falls to the House, but the pity is no smaller because of that. Our national records are shamefully housed. Hardly a fragment of them is sheltered in anything resembling fire-proof structures, while a great part of them are kept in veritable fire-traps.

After eighteen years as Professor of Design in the Royal College of Arts, Professor W. R. Lethaby, well and favorably known to the architectural profession in the United States, has retired. At a meeting of the Art Workers' Guild, his portrait by Rothenstein was presented to Mrs. Lethaby, and Mr. W. J. Mackail spoke in appreciation of his long service. In reply, Professor Lethaby said that he was born to read Ruskin and to look at Morris and Philip Webb. The kind of architecture he loved was that of buildings "honest and human," with hearts in them, and he summarised his belief of a lifetime in the faith that "art is rooted essentially in sound work," that "great discovery" of Morris.

Furniture Guilds, following after the Building Guilds, are said to be gaining a secure foothold in Manchester, England. Opinion seems to agree that the furniture is not only better made by the furniture guildsmen but that the prices are below those asked for similar articles made in industrial establishments of the usual order. As to the effect of the guild upon the worker, which is after all the important question, there is every indication from reports that the men are greatly influenced in their life and their craft by the industrial liberty to which they have won. Whether they can retain it is of course a matter of speculation. The Building Guilds report contracts of £2,000,000 in hand. They have begun the regular issue of their publication called "The Building Guildsman."

Opinion seems to be united on the success of the International Theatre Exhibition at Amsterdam, where are shown the works of theatre designers in America, Austria, England, France, Germany, Holland, Switzerland and other countries. If American exhibitors were inadequately represented,—due no doubt to the difficulties of distance and transportation,—it seems to be agreed that with Germany, we share the honors that go to an effort directed to a more dynamic, vivid, and complete expression. The work of Robert Edmund Jones comes in for sincere praise, while that of Lee Simonson, Joseph Urban, Mordecai Gozelik, and Ernest de Weerth attracts a not unfavorable comment. From Hermon Ould, the English critic, Gozelik's setting for Tolstoi's "Powers of Darkness," evokes more than passing appreciation.

The exhibition occupies eight large rooms of the Municipal Museum. It consists of designs for theatres; plans, elevations, sections for scenes; costumes, curtains, masks, as well as models of both theatres and settings. Great praise is given to the Dutch organisers of the exhibition, H. Th. Wijdevelt, and Frits Lausvelt, and to W. Buning, who has collaborated. The exhibition was opened with an address by Gordon Craig, to whose work three sides of the principal room are devoted. The other side is given to the showings of Adolphe Appia, the Swiss artist, who has, with Craig, so greatly influenced the modern stage. Generally, the exposition seems to mark a decided tendency to the greatest architectural simplicity, with more and more reliance for effect upon lighting.

In the housing competition in New York City held under the auspices of the Chamber of Commerce, Merchants' Association, Real Estate Board, and the Phelps-Stokes Fund, the awards were as follows: First Prize, the commission to erect a house on a 100 x 100 lot, to Sibley & Fetherston. Second Prize, $1,500, Frank J. Shefcik.

Third Prize, $1,000, John Tompkins. A supplementary prize of $100 was awarded to Raymond M. Hood.

WHY more young men do not enter the draughting vocation and what can be done to secure more draughtsmen is to be the subject of study for a committee of the Wisconsin Chapter.

IN OREGON, the Commission handling the State Bonus Bill has received 7,000 applications for funds for building homes for returned soldiers, under the provisions of the Act creating the Commission. Loans of this kind are limited, it is reported, to $3,000; they must be amortized in 20 years and will bear 4% interest. The Commission is interested in the work of the Architects' Small House Service Bureau, Northwestern Division, the members of which are preparing actively to co-operate in seeing that the soldiers get the best possible homes for the money.

SAN DIEGO is likely soon to be headquarters of a new Chapter of the Institute, according to the report made by Mr. Bergstrom to the Southern California Chapter. This will give the Institute an even fifty Chapters, including the new Westchester Chapter of New York.

MOUNTAIN Division, Architects' Small House Service Bureau, is distributing advance sheets from the catalogue soon to be issued by the Bureau. The designs cover a wide range of types, carefully studied in their adaptability to conditions such as are found within the territory of the Bureau. Those desiring further information as to the activities of the Bureau are referred to the Secretary, 415 Chamber of Commerce Building, Denver, Colorado.

MOLIERE'S three hundredth anniversary (he died in 1622) was observed by the Department of Drama, College of Fine Arts, Carnegie Institute of Technology, by the presentation of two plays, "Les Femmes Savantes," and "Don Juan." During the same period, when seven performances were given, the Faculty of the College gave an exhibition of their work in the Galleries of the Institute. The Department of Music gave a symphony concert, including Goldmark's "Sakuntala," Symphonic Variations by Franck, and a Cello Concerto by Lalo. The exhibition remained open through the greater part of February, and afforded another indication of the great value of the collaborative work organized by Professor Bossange, who is Dean of the College, which includes the Department of Architecture, of which Professor Harry Sternfeld is the head.

THE last meeting of the Wisconsin Chapter was much taken up with a discussion, inaugurated by Mr. Rotier, on the subject of a Bureau of the Architects' Small House Service. Mr. Rotier offered the following resolution, which was adopted:

"Resolved, That the Wisconsin Chapter, A. I. A., approves of the formation of the proposed North Central Regional Bureau of the Architects' Small House Service Bureau of the United States, Inc., and encourages it to carry on its program with all dispatch and energy."

New Members Elected

ALABAMA: Jacob E. Salie, *Birmingham.* CENTRAL ILLINOIS: Harry J. Reiger, *Springfield.* CENTRAL NEW YORK: L. J. Kaley, *Binghampton.* CLEVELAND: Harry A. Fulton. ERIE: William F. Frank. FLORIDA: M. Leo Elliott, *Tampa.* ILLINOIS: James R. M. Morrison, Walcott S. Russell, *Chicago.* INDIANA: A. Frank Wickes, *Gary.* NEW YORK: Bevan Jones, Eugene Henry Klaber, *New York City.* PITTSBURGH: William R. Lewis, *Bluefield, W. Va.* TENNESSEE: Richard L. Seig, *Memphis.* TEXAS: Guy Lewis Frazer, H. C. Trost, *El Paso;* George Willis, *San Antonio.* WASHINGTON, D. C.: Alexander H. Sonnemann.

Obituary

Evarts Tracy

Lieutenant Colonel Evarts Tracy, D. S. C., died on Tuesday, 31 January, after a short illness in Paris, while engaged in reconstruction work in the devastated regions around Rheims. A graduate of Yale in the Class of 1890, he studied for three years at the École des Beaux Arts and after a short time in the office of McKim, Mead & White commenced independent practice of his profession in 1896, and formed the firm of Tracy & Swartwout four years later. The work done was extremely varied in character,—some domestic and commercial, but the bulk of it monumental. The Hotel Webster and the Home Club in New York were early examples and of the later work won in competition, the Denver Post Office, the Missouri State Capitol and the Milford Town Hall were the most prominent. The Victory Memorial Building for the George Washington Memorial Association, the cornerstone of which has just been laid, was won in competition in 1914.

Tracy had always a great interest in military affairs, was at Plattsburg for two years and on the outbreak of the war was commissioned Major of Engineers. He served with distinction here and abroad and was in charge of the Camouflage Section and an instructor in camouflage, and has written many articles on that subject. He was promoted to the rank of Lieutenant Colonel and was recently awarded the Distinguished Service Cross. Personally, Tracy was a very lovable character. At college he was the most popular man in his class and in his profession and in the Army he was the friend of everyone who knew him, and he knew everybody. He was at home everywhere and was vitally interested in everything that went on. His specialty, as he often said, was miscellaneous information. There was not a subject on which he could not converse intelligently: with the medical profession he talked like a doctor and among lawyers he would pass as a lawyer, and when he entered the Army it seemed as if he had been a soldier all his life. He liked it and he looked it, and he gave his life to it, for the fatal attack of heart disease which carried him off in the midst of his reconstruction work was directly attributable to an accident in a trench at the Front. He lived his life to the full and he enjoyed every minute of it. He died as he would have wished to die, in the vigor of life and in the midst of the work he had loved. He was a man and a lovable man, and the fact of having known him is a pleasant memory. E. S.

Lowell A. Lamoreaux

Elected to the Institute in 1907
Died at Minneapolis, Minnesota, 1 February, 1922.

Structural Service Department

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In connection with the work of the Committee on Structural Service of the American Institute of Architects and in collaboration with other professional societies and organized bodies having the same objective—improvement in building materials and methods and better shelter for humanity in all its manifold vocations and avocations.

Committee Activities

Paint-On-Wood Research.—The A. I. A. has been invited by the National Research Council and the Engineering Foundation to join with them and the U. S. Forest Products Laboratories in carrying out a program for national research to develop fundamental knowledge of paints and varnishes as protective coatings for wood.

In carrying out this program, the purpose is to secure the cooperation of the lumber, wood-working and paint industries, the A. S. T. M. and other national technical bodies and interest Government Departments and Bureaus.

Through laboratory study and field experimentation it is proposed to determine the best materials for various purposes, conditions and woods, and the most effective methods of application; to establish probable relative costs, durability and appearance; and the means by which to determine the dimensional changes in wood due to absorption and loss of moisture.

Specifications for Glazing Glass.—In August, 1921, the U. S. Bureau of Standards, communicated to the A. I. A. its purpose of writing specifications for glass for glazing, and asked for A. I. A. cooperation.

On October 12th a conference was held at the Bureau of Standards, attended by representatives of the Bureau, sheet and plate glass manufacturers, glass distributors and the A. I. A. The Conference decided to invite the cooperation of the sash and door manufacturers. A Committee on Classification and Nomenclature was appointed which will meet in Washington on March 6th. The Bureau has made a large collection of glass samples which have been under test to determine strengths.

Simplified Practice.—Within the U. S. Bureau of Standards there has been created a Division of Building and Housing. Among the activities of this Division there are two which are of peculiar interest to the architects. A basic building code for dwellings is being prepared by a Committee on which the A. I. A. has two representatives. Another activity is directed toward the elimination of unnecessary and uneconomic dimensional variations and of styles and types of products utilized in construction.

The first accomplishment recorded in the field of simplified practice is a reduction in the number of sizes and types of paving brick from sixty-six to eleven.

On Feb. 13th a Committee of representative structural engineers, contractors and architects, the last as representatives of the A. I. A., met in Washington on the invitation of the Department of Commerce to consider the need and advantages of simplified practice in connection with construction generally and to list those materials or classes of material and devices now produced in wide and useless variety of size and character, in connection with the production of which economy would result from simplification.

The Conference declared in favor of the general principles of simplified practice and recommended that immediate consideration be given to the following:

Mill-work, plumbing (roughing dimensions and fixtures), heating, interior wall construction, hardware, lighting fixtures.

At the request of the Division of Simplified Practice the Conference resolved itself into a Continuing Advisory body and appointed an Executive Committee consisting of Noble F. Hoggson, W. H. Ham, and S. W. Jones.

Weather Strips.—There are no criteria with which to measure and compare the infiltration of air through windows and doors of various types or the relative efficiencies of the several weather strips manufactured. Several years ago a series of tests were conducted to determine the weathering efficiency of a series of windows. The results of these tests were reported in a paper prepared by Mr. S. F. Voorhees and H. C. Meyer, Jr., and published in the January 1916 Journal of the American Society of Heating and Ventilating Engineers.

There is a very urgent need first for a standard method of testing to determine air infiltration, and second, for definite knowledge as to the causes and of the means of checking infiltration of air through windows. To the end of satisfying that need the A. I. A. has decided to call a conference of weather strip manufacturers, representatives of the American Society of Heating and Ventilating Engineers and the A. I. A. to organize and sponsor the necessary research work which will be conducted by the research laboratory of the American Society of Heating and Ventilating Engineers located at the Bureau of Mines Experiment Station, Pittsburgh, Pa.

The Slate Industry Organizes.—At the instance of the National Federation of Construction Industries there was held in New York on Feb. 8th a meeting of representatives of the producers of structural and roofing slate, the U. S. Geological Survey and the A. I. A. A Committee of representatives from five of the slate producing districts was appointed to prepare a Constitution and By-Laws for a National Association of Slate Producers. The Committee will make its recommendations to a future conference.

Barrett Roofs.—During January and February there were a series of discussions between a representative of the Barrett Company, the Barrett Company's Advertising Agency and the Chairman and Technical Secretary of the Committee on Structural Service to the end of establishing the difference between "Black Diamond" pitch and felt and "Specification" pitch and felt and to determine whether, when one buys a twenty year bonded roof, one buys a bonded guarantee or a roof that will actually last twenty years, and again what assurance aside from the bond, there is that the roof will last twenty years.

To secure a record of experience with Barrett bonded roofs, a questionnaire has been sent to the members of the Committee on Structural Service. The Committee will be glad to receive from A. I. A. members any information on the following points:

Do roofing contractors quote lower prices on "Barrett Specification Roofs" when a bond is not called for than when a bond is required?

What has been the experience with Barrett inspection on bonded roofs?

Are there any cases of a roofing contractor's inability to accept a contract for a bonded roof because he was not on the Barrett approved list and was refused approval?

American Standard Specification for Portland Cement.—The American Engineering Standards Committee has adopted an "American Standard" Specification for Portland Cement, designated as American Engineering Standard Specification No. 1. The A. I. A. membership in the Standards Committee and its vote as a member for the adoption of this standard carry automatically the A. I. A. approval of the standard.

In this connection it is noteworthy that at its January 1922 convention the Portland Cement Association, by an amendment to its Constitution, made membership in the Association contingent upon the members product meeting the standard specification.

Bureau of K-V Standards.—An organization so designated and operated by Philip Kobbe Co., Inc., advertising agency, has been

circularizing the architectural profession in the East offering a service consisting of a method and its application by which the best material for a given purpose may be "unerringly" selected. The Committee on Structural Service has undertaken an investigation to determine the character and value of the service offered.

Depreciation and Obsolesence.—The Committee on Structural Service has received several inquiries for information on methods or formula for computing the depreciation of buildings. This matter of depreciation necessarily entails the whole problem of obsolesence. The conclusions drawn from the Committee's effort to secure information on depreciation and obsolesence are that there is no recognized method or formula for establishing depreciation and that there is very little understanding of the whole problem of obsolesence. In its quest for information the Committee got into communication with the National Association of Building Owners and Managers and found that this Association had a Tax Committee at work on the problems of depreciation and obsolesence and another Committee on Accounting and Exchange.

The building owners and managers seem to be anxious to establish a cooperative connection with the architects to the end that experiences may be exchanged and that architects may be furnished with accurate figures on the costs of operating various types of commercial buildings. The Committee on Structural Service will shortly send out a questionnaire to secure information on some specific points which the National Association of Building Owners and Managers is anxious to get.

Abstracts

It is the purpose of the Structural Service Committee and THE JOURNAL *jointly to give in this division each month, brief abstracts of all publications by the Government Departments and Bureaus, University and other research laboratories, States and Associations, which contain fresh information in regard to materials or methods employed in construction and thus afford architects and others a convenient means of keeping themselves conversant with rapidly expanding knowledge in the technique of construction.*

Effect of Moisture Content upon the Expansion and Contraction of Plain and Reinforced Concrete. (4a)—*University of Illinois. Engineering Experiment Station. Bulletin No. 126, by Torata Matsumoto. Size 6" x 9". Pages 29.*)—Aside from the action of direct load, deformations are produced in concrete by changes in temperature and in moisture content. With reference to temperature changes in reinforced concrete, it is well known that, regardless of differences in the mixture, concrete has practically the same coefficient of expansion as steel, so that the two materials contract or expand together. Moisture content, on the other hand, has the undesirable property of affecting concrete alone. Concrete, like wood, clay, and some other materials, expands when it absorbs moisture and contracts when it is dried; steel has no such action. After the concrete is poured the steel remains unchanged with changes in moisture conditions, while concrete ordinarily shrinks a considerable amount. Aside from the stresses set up in steel and concrete by the shrinkage of the latter, the resulting formation of cracks large or small will produce a condition which may be favorable to the corrosion of the steel or the disintegration of the concrete after repeated changes from dry to wet condition.

The tests which are described were made to investigate the amount of shrinkage which may be expected in a mortar or a concrete, the relation between the change of moisture content and the change of length of these materials, the difference in shrinkage of plain and reinforced concrete, and the internal stresses set up in the latter. For purposes of comparison with the results obtained with concrete, a few tests were made on the effect of the obsorption of water by sandstone and limestone.

Detailed descriptions are given of the materials used in test specimens, of the effect of moisture content on length of specimen and of the shrinkage stresses in reinforced concrete.

Conclusions.—1. Concrete expands when it absorbs moisture and contracts as it is dried. Concrete of a 1:2:4 mixture is likely to contract during hardening as much as 0.05 per cent in an ordinary structure.

2. Contraction of concrete by the loss of moisture causes stress in the concrete when it is restrained by an external force. The amount of this stress is not as small as is generally supposed.

3. The shrinkage stress caused in the steel in reinforced concrete may reach the usually accepted working stress of steel when the amount of reinforcement is less than 1:5 per cent.

4. The shrinkage stress developed in 1:2:4 concrete may reach the ultimate tensile strength of the concrete when the amount of reinforcement is greater than 1.5 per cent. With richer mixtures the increase in shrinkage stress may be relatively greater than the increase in ultimate strength.

5. The greater the percentage of reinforcement the greater the tensile stress that may develop in the concrete, and concrete having a higher percentage of reinforcement than 1.5 per cent is likely to have cracks formed unless proper provision is made.

6. In reinforced concrete out of doors, subject to alternate wet and dry conditions, cracks may readily be formed under the repeated stress which is nearly equal to the tensile strength of the concrete.

7. Reinforced concrete does not appear likely to be a durable material in a place where a corrosive influence on steel, such as sea air, is active, unless proper protection against the formation of shrinkage cracks is made.

8. It is suggested that the prevention of shrinkage stress in concrete might be accomplished in two ways, either by finding a cement giving less expansion and contraction, or by the use of a perfect waterproofing treatment.

9. It may be expected that an integral waterproofing compound might lessen the change of volume for a short time, but it would not prevent the final diffusion of moisture with consequent change in volume.

Bond Between Concrete and Steel. (4a2)—*Technologic Paper of the Bureau of Standards No. 173. "Tests of Bond Resistance Between Concrete and Steel," by W. A. Slater, Engineer Physicist, F. E. Richart and G. G. Scofield, Structural Engineers. Pages 66. Size 7" x 10".*)—This paper embodies the results of three somewhat dissimilar investigations which were made by the concrete ship section of the Emergency Fleet Corporation. First the effect on bond resistance of the application of various anticorrosive coatings on reinforcement. Second the length of lap required for effective splicing of reinforcing bars in regions of high tensile stress. Third, the relative merits of different methods of anchoring the ends of stirrups to meet certain conditions which arise in concrete ship construction.

Effect of Application of Anticorrosive Coatings.—For these tests one-half inch steel reinforcing bars, both plain and deformed, were used. Eighteen kinds of protective coatings were investigated. These included various preparations of coal tar, asphalt, red lead, iron oxide and various kinds of metal coating. The bars were embedded in cement mortar, mixed in the following proportion by weight: 1 part portland cement, 2 parts sand and 0.485 parts water.

Nature of Bond Resistance of a Coated Bar.—A study of bond between concrete and uncoated steel has indicated that bond resistance is made up of two parts, adhesive resistance and sliding resistance. Adhesive resistance comes into play before the bar begins to slip. Sliding resistance is evidently due to friction between the concrete and the surface of the reinforcing bar, which may be, comparatively speaking, rough and irregular in form.

With the deformed bar the projecting lugs provide additional resistance after slipping has begun. It is believed that the adhesive resistance between the concrete and the longitudinal surfaces of the bar is destroyed before there is enough movement

to develop much compressive stress between the beveled surface of the lug and the concrete in contact with it.

The action of a coated bar embedded in concrete is undoubtedly of a different nature from that of an uncoated bar. With the more plastic coatings especially, slipping may be due to three possible causes, as follows: (1) Slip between the coating and the concrete; (2) flowing or shearing deformation in the coating in the direction of motion; and (3) slip between the coating and the bar.

A very soft paint may act merely as a lubricant tending to facilitate slipping of the bar, while a hard, brittle paint may crumble when acted upon by shearing forces. Although the resistance of these paints to distortion is not known, it seems likely that the shearing strength of a paint is less than its adhesion to steel or concrete. On the other hand, a metallic coating, such as zinc, is elastic and has a comparatively high shearing strength, so that failure might be expected to occur through slipping of the zinc on the concrete.

Summary.—Results of this series of tests have shown a wide variation in the behavior of different coatings. A few of the results may be summarized here for convenient reference.

(*a*) The maximum bond stress developed by bars which had been painted was generally considerably less than for unpainted bars, but the reduction in maximum bond stress due to galvanizing and some similar processes was less than that due to painting.

(*b*) With the exception of certain metallic coatings, the maximum bond stress for plain coated bars was reached after considerably greater slip than with uncoated bars. The amount of slip of coated bars at maximum stress was often 0.02 to 0.03 inch. Furthermore, the bond resistance did not decrease as rapidly as with uncoated bars with continued slip after the maximum load had been reached. Certain metallic coatings, however, reached maximum bond resistance with very small slip, followed by a sudden decrease in bond load with increasing slip. In a reinforced concrete beam under a constant load, such a yielding of the bond resistance might cause failure without warning.

(*c*) Coated deformed bars apparently slipped considerably before the corrugations or lugs reached a firm bearing. After this had taken place, the increase of resistance with increase of slip was similar to that in uncoated deformed bars.

(*d*) The bond resistance at a slip of 0.001 inch was a much smaller proportion of the maximum bond resistance for coated bars than for uncoated bars. A slip of 0.001 inch has been considered by some to produce critical conditions of bond stress in a beam.

(*e*) For pull-out specimens employing coated bars, continuous and intermittent storage in artificial sea water resulted in bond strength averaging about three-fourths as great as from storage in air.

(*f*) Sanding of painted bars tended to increase the bond resistance in a number of cases; also dipping bars in paint often resulted in a lower maximum bond stress than was found for bars painted with a brush. However, the effectiveness of the manner in which a coating is applied seemed to depend upon the nature of the paint, and should be determined by test in every case in which it is important to have this information.

Length of Lap Required for Effective Splicing.—For this investigation, tests were made on four beams, 10 feet 8 inches long, 10 inches wide, and 12 inches deep. In three of the beams the tension reinforcement consisted of 6 plain round bars, extending the full length of the beam, and 2 short bars extending from opposite ends of the beam to a point 20½ inches beyond the center of the span. This gave the short bars a lap of 41 inches, which was symmetrical about the center line of the span. In the fourth beam no through bars were present, but the lapped bars were placed in the same relative positions as in the other 3 beams. All lapped bars were one-half inch plain round. The through bars were ½ inch round in one beam, ⅝ inch round in a second and ¾ inch round in the third. All bars were anchored at the ends of the beams by means of semicircular hooks. The lapped bars had no mechanical anchorage at the ends of the laps.

The concrete was mixed in the approximate proportion of 1:1:1 by volume. The fine aggregate was of two sizes: (1) a bank sand, all of which passed a one-eighth inch screen; and (2) screenings from the gravel varying from one-eighth to one-fourth inch. The coarse aggregate consisted of pebbles from one-fourth to one-half inch in size. Lehigh portland cement was used.

Summary.—The following statements summarize the results of the beam tests referred to above:

(*a*) Proceeding along a lapped bar toward its unanchored end from the point where the stress in it begins to diminish, the stress lost is picked up by the other bars of the beam. In a majority of cases a larger amount of the stress lost by the lapped bar was picked up by bars immediately adjacent than by the other bars of the beam.

(*b*) The maximum bond stress developed by the lapped bars was about 75 per cent of that reported for pull-out tests of uncoated plain square bars. The maximum bond stress occurred at a smaller amount of slip of bar for the beams than for the pull-out tests.

(*c*) The average bond stress in the lapped bars was practically independent of the tensile stress in the bars, but the length over which it was effective varied with the magnitude of the tensile stress.

(*d*) For the purpose of design the minimum safe length of lap may be taken as the distance from the unanchored end of the lapped bar to a point on the bar where the bond stress is zero, when the tensile stress in the steel is at the yield point. With this assumption the tests indicate that using steel which has a yield point stress of 40,000 pounds per square inch, and with continuous bars adjacent to the lapped bars and with concrete of the grade here used (average compressive strength 5,020 lbs. per sq. in. at 27 days), the lap should be about 48 diameters. Care should be used in applying this relation under other conditions.

(*e*) The tests of beams with through bars do not show that differences in the ratio of the area of the through bars to the total area cause any variation in the length of lap required. The test of the beam with no through bars indicated that when all the bars are lapped, a longer lap is needed than when through bars are present. Further investigation is needed on this phase of the subject.

(*f*) A shearing stress of 465 pounds per square inch was developed in one of the beams without sign of approaching failure by diagonal tension.

Anchoring Ends of Stirrups.—Stirrups were made from ⅜ inch round steel bars, bent into U shape with hooked ends. Three types were tested. Type I had the hooked ends bent perpendicular to the plane of the legs. Type II had the ends bent into loops through an angle of 270 degrees in which the planes of the loops were perpendicular to the plane of the legs. Type III had the ends bent outward at 90 degrees from the legs and in the same plane.

The tests show that Type II stirrups were much more effective when the loops were filled with concrete than when they were empty and under such conditions were stronger than either Type I or Type III. Even when the loops were not filled with concrete the stirrups of Type II were better on the average than those of Type I. In general the stirrups which had the deepest embedment of the hooked and looped ends showed the greatest strength. An embedment of not less than 2 inch is apparently desirable.

Linoleum. (28i1)—(*U. S. Department of Agriculture. Farmers Bulletin 1219. Floors and Floor Coverings. Pages 36. Size 6" x 9".*)—Linoleum is made by mixing together ground cork, oxidized linseed oil, and various gums into a plastic mass, and pressing, or "keying," as the manufacturers say, this onto a backing of jute burlap. "Green" linoleum is the term used for it at this stage, and in order to season it it is sent to drying rooms for from 1 to 6 weeks, depending on the thickness.

There are three general types of linoleum on the market: Plain, inlaid, and printed. The plain, as the name implies, has no design and the coloring matter is added to the plastic mass, or "mix," as it is technically called, before it is applied to the burlap backing. It is made in a variety of colors—browns, grays, greens, and even dull blue and old rose—as well as combinations of two tones of one color, which break the severely plain effect and make footprints and such marks less conspicuous. Having no pattern to match, it is easier and more economical to lay than the figured kinds.

Inlaid linoleum is so made that the color in each part of the design extends to the backing, as can be seen by examining the edge. The pattern, therefore, will last as long as the linoleum itself. In straight-line inlaid the design is more sharply defined than in the other kind known as granulated, in which the edges of the various parts of the design blend slightly into each other. There is little, if any, difference in the wearing quality of these two kinds when the relative cost is considered.

Printed linoleum is made by stamping with oil paint, a design on a thin grade of plain. A greater variety of colorings and designs is thus obtainable at less expense than in the case of the inlaid kinds, but because the design is only painted on the surface and does not go through to the base, printed linoleums can not be expected to give such lasting service. They are, however, relatively inexpensive and are satisfactory in places where the wear is not excessive.

In general, the quality or grade of all linoleum depends on the proper seasoning and the thickness. Naturally, the thicker the material the more wear it will give, and where traffic is heavy the thicker will be found more economical in the long run. Smoothness of finish, which can be judged by the touch with a fair degree of accuracy, is another characteristic worth considering because it affects cleaning. The dirt does not grind into the smoother finished linoleums, and they are easier to clean than those with a rougher surface.

Plain linoleum is usually made in strips 6 feet wide, and inlaid and printed in strips 2, 2½, 3, and 4 yards wide, though the 2 and 4 yard widths are most common. The price of linoleum is generally given by the square yard.

Laying Linoleum.—The floor under it should be level, smooth, tight and dry. On rough floors linoleum will wear unevenly, and moisture will cause the burlap backing to deteriorate and may attract water bugs and other household pests. Cement and composition floors may need special treatment before linoleum is laid.

In cold weather linoleum should be placed in a warm room for at least 48 hours before it is unrolled. If this precaution is not taken, the linoleum is likely to crack, because cold makes it brittle. There are two ways of fastening linoleum to wood floors—tacking and cementing. The first is the simpler method, but by the second the seams and edges are made water-tight and the linoleum is said to give longer service. The linoleum should be cut in strips running crosswise of the floor boards if possible. If it is to be tacked, the strips should be fitted snugly together along the seams but should not be fastened for 3 or 4 weeks, for linoleum usually expands when laid on a floor and if tacked down at once will buckle. To give plenty of room for this expansion, it is a good plan to trim the edges next the baseboard for ¼ or ⅜ inch, or just enough so that the molding will cover the edge. The molding should then be nailed directly to the baseboard, leaving the linoleum free to expand and to be trimmed more next to the baseboard if necessary. The linoleum may be so perfectly held in place that it will not need to be tacked, but if it does, brads should be set ½ to ¾ inch from the edge about 3 or 4 inches apart and driven well below the surface.

Linoleum may be cemented at the seams and edges directly to a wood floor or permanently cemented down firmly over a layer of deadening felt paper that has itself been pasted to the floor. The cement used should be waterproof and contain no silicate of soda (water glass) because this is injurious to the linoleum when moisture comes in contact with it.

Floor Oilcloth.—Printed linoleum has largely replaced floor oilcloth, though the latter is still used where investment in the more expensive material would not be justified. It also has a foundation of canvas, burlap, or similar material to which successive coats of waterproof paint are applied. The design is stamped on after the last coat of paint has dried and been rubbed smooth. Floor oilcloth should not be confused with enameled oilcloth used for covering tables and shelves; the latter is made of other materials and by an entirely different process. Oilcloth is generally tacked to the floor and should be cleaned and cared for like printed linoleum.

Artificial Daylight for Merchandising and Industry. (31a1—) (*Bulletin L. D. 104, Lighting Data, Edison Lamp Works. Size 6" x 9". Pages 15.*)—In this bulletin the following subjects are discussed: Color of Natural Light, Demands for White Light, Method of Modifying Artificial Light, Accurate Color Matching Units, The Daylight Mazda Lamp, Color Modifying Globes and Specific Applications of Modified Light.

The following list indicates some of the leading articles on the general question of artificial daylight and kindred subjects which have appeared in the technical magazines during the past few years: "*Color Values of Light from Electric Lamps,*" G. H. Stickney, Trans. I. E. S., Vol. 5, p. 431. "*Daylight and Artificial Light.*" E. L. Nicols, Trans. I. E. S., Vol. 3, p. 301. "*Daylight Efficiency of Artificial Illuminants,*" H. E. Ives, Bulletin Bureau of Standards, Vol. 6, p. 231. "*The Subtractive Production of Artificial Daylight,*" H. E. Ives and M. Luckiesh, Electrical World, May 4, 1911. "*The Relation Between the Color of the Illuminant and the Illuminated Object,*" H. E. Ives, Trans. I. E. S., Vol. 7, p. 62. "*Color of Illuminants,*" L. A. Jones, Trans. I. E. S. Vol. 9, p. 687. "*Artificial Daylight: Its Production and Uses,*" M. Luckiesh and F. E. Cady, Trans. I. E. S., Vol. 9, p. 839. "*Development of Daylight Glass,*" E. J. Brady, Trans. I. E. S., Vol. 9, p. 937. "*Some Data on Artificial Daylight Units,*" C. H. Sharp, Trans. I. E. S., Vol. 10, p. 219. "*A Gaseous Conductor Lamp for Color Matching,*" D. McFarlan Moore, Trans. I. E. S., Vol. 11, p. 192. "*Colored Glass in Illuminating Engineering,*" H. P. Gage, Trans. I. E. S., Vol. 11, p. 1050. "*Commercial Uses of Filtered Light,*" C. E. Clewell, Electrical Review, April 7 and 14, 1917. "*Mazda C-2 Lamps and their Applications,*" A. S. Turner, Jr., National Electrical Contractor, October, 1917. "*The Color of Artificial Light in the Medical Profession,*" A. L. Powell, Medical Times, October, 1917. "*Mazda C-2 Lamp and Its Applications,*" A. L. Powell, Electrical Engineering, December, 1917. "*Artificial Daylight in the Industries,*" M. Luckiesh, Electrical World, Sept. 28, 1918. "*A Color Symposium,*" Trans. I. E. S., Vol. 13, p. 1. "*A Symposium on Camouflage,*" Trans. I. E. S., Vol. 14, p. 216. "*The Daylight Mazda Lamp in the Psychological Laboratory,*" G. J. Rich, American Journal of Psychology, July, 1919.

Industrial Lighting. (31a13)—(*Bulletin 20A Engineering Department, National Lamp Works. Size 6" x 9". Pages 95.*)—The contents of the bulletin fall under five main divisions: Part I. Requirements of Good Illumination, Working Intensities of Daylight Illumination in Foot-candles, Illumination of Surrounding Surfaces, Color Quality of Light, Glare, Specular Reflection, Shadows; Part II. Mazda Lamps,—Power-Factor, Performance, Technical Data for Various Voltages, Position of Burning for Mazda C lamps, Ventilation, Voltage Fluctuation, 110–125 Volt Lamps on 220–250 Volt Circuits, Technical Data on 110–125 Mazda C Lamps for Floodlighting Service, Separation of Lighting and Power Circuits; Part III. Reflecting and Diffusing Accessories; Part IV. Exterior Lighting for Industrial Plants; Part V. Illumination Design, Choice of a System, Design of General Lighting System, Selection of Unit, Selection of Intensity, Present Standards of Intensity, Determination of Coefficient of Utilization, Determination of Total Light Flux, Location of Light Sources, Determination of Size of Lamps, Analysis of Operating Costs, Total Annual Operating Costs;—Appendix.